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No. XXIV. OF VOL. I., 1924. LONDON, SATURDAY, JUNE 14, 1924. Pp. 112—Price 1s.
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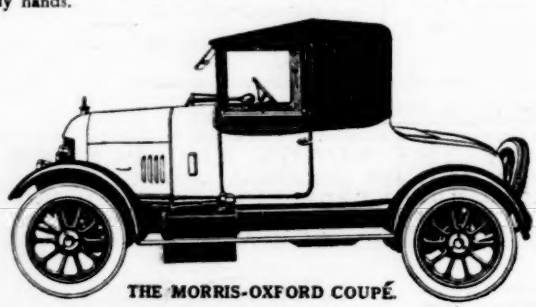

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An Account

OF THE

TUBERCULOSIS OBSERVATION WORK OF THE MINISTRY OF PENSIONS.

Based on papers read before the Tuberculosis Society on March 14th, 1924,

BY ALEX. SANDISON, M.B., B.C. CAMB., B.SC. LOND.,
ASSISTANT DIRECTOR OF MEDICAL SERVICES;
AND
G. BASIL PRICE, C.M.G., M.D., F.R.C.P. LOND.,
DEPUTY COMMISSIONER OF MEDICAL SERVICES (TUBERCULOSIS).

I. PREFACE ON ORGANISATION.

BY DR. SANDISON.

ACCURATE diagnosis of tuberculosis is at all times a matter of great importance, but to the Ministry of Pensions such accuracy is specially essential, for dependent upon the diagnosis of this disability is the acceptance or rejection by the State of a liability extensive both in time and in amount. I do not propose to discuss the questions involved in a decision as to whether or not an existing tuberculosis in an ex-Service man can be accepted as attributable to or aggravated by war service. Such problems of "entitlement," as they are technically termed, in allusion to the entitlement to pension which is involved, are peculiar to the Ministry and absorb a very material proportion of its time and work. Happy are they who need take no thought of such subtleties. Before, however, entitlement can be considered it is essential that the Ministry should know precisely what is the condition for which entitlement is claimed. The term "debility," for example, is one which covers a multitude of pathological conditions of which tuberculosis obviously is one. The private doctor, dealing with a case of debility accompanied by some prima facie evidence of past or present tuberculosis, can often act on the assumption that tuberculosis is the causal factor, and though he may not necessarily give a definite diagnosis of tuberculosis to the patient, he may yet prescribe general and special treatment which, if tuberculosis is really present, will certainly do good, but if it is not will do no harm and may quite possibly cure the debility without it ever being known what was the actual cause. Such treatment, though more or less empirical, is frequently abundantly justified by results. The debility departs, the patient rejoices, and the affair is over. If, however, the patient is an ex-Service man who claims that his debility is consequent on war service, the matter at once becomes much more complicated. Suppose "debility" as such is accepted as due to service, the State may then be committed to the responsibility of treating indefinitely a condition which is simply the common factor of almost innumerable pathological conditions and which may recur from time to time from totally different causes. If, however, a prima facie ætiology of tuberculosis is accepted, and entitlement is given definitely for tuberculosis, the State has then accepted responsibility for a condition of very serious portent and implication. Thus, as regards entitlement, true justice can only be done, to the man and to the State, by attaining the greatest possible accuracy of diagnosis.

It soon became apparent in the work of the Ministry that the existing diagnoses of tuberculosis in ex-Service men lacked in many cases that necessary precision. Tuberculosis was at times diagnosed during service on evidence which would not have been accepted had the necessary time and facilities been available to investigate it fully. Even a record of tubercle bacilli being found in the sputum could not always be accepted as gospel truth. On the other hand, disordered action of the heart, neurasthenia, malaria, pyrexia of unknown origin, were army diagnoses which not infrequently masked a true tuberculous condition.

Thus before the war had long been over there were numbers of pensioners with, on the one hand, an entitlement for a tuberculosis which did not exist, and on the other a lack of entitlement for a tuberculosis that did. Add to these cases the steady stream, not yet run dry, of those who submitted claims for entitlement for a tuberculous condition which revealed itself subsequent to discharge from the Service, and it needs little imagination to see that it became an urgent necessity for the Ministry to make sure that the most modern and efficient methods available were utilised for obtaining the evidence upon which entitlement for tuberculosis was to be based. Obviously the first line of defence was the tuberculosis service of the country, to which, in view of its existing extensive organisation and facilities, the function of treating the tuberculous "other rank" pensioner had been delegated by the Ministry. Tuberculosis officers were in direct charge of these pensioners, and to them, therefore, the Ministry applied for evidence as to the presence or absence of tuberculosis in individual cases. As time went on, however, three things became apparent.

1. The facilities for full and complete observation of doubtful cases of tuberculosis varied very greatly in different parts of the country, and true observation wards were rarely available.

2. Considerable divergence of opinion existed as to the relative value of different diagnostic criteria, and the "personal factor" of the tuberculosis officer could not be effectively equated.

3. Tuberculosis officers, not unnaturally, were inclined to attach special importance to an already existing diagnosis if it was recorded officially in army or pensions documents.

In 1920 the Ministry arranged for 100 cases taken at random of men pensioned for tuberculosis to be subjected to a comprehensive expert examination, and it then appeared that about one-third of these were wrongly diagnosed as tuberculosis. Other evidence, pointing to similar conclusions, accumulated from various directions, and finally, after consultation with the Ministry of Health, the Ministry decided to provide for itself full facilities for the complete investigation of doubtful cases of tuberculosis amongst pensioners. For this purpose, early in 1922, wards were allotted in certain Ministry hospitals throughout the country, the hospitals chosen being well equipped with laboratory and X ray facilities. The total number of beds so allotted has averaged over 200 for England and Scotland since that time. In Wales special arrangements were made with the Welsh National Memorial Association for observation to be carried out in their sanatoria.

It was an essential part of the scheme that the observation should be conducted in a uniform manner throughout the country, and that the duty of arranging for such observation and of making a definite decision on the evidence thus obtained should be placed in the hands of a small number of specially qualified medical officers whose methods and results could be coördinated through headquarters. Seven such officers (Deputy Commissioner of Medical Services, Tuberculosis) have been appointed, their activities covering England, Scotland, Wales, and Ireland. Their duties, however, are not limited to the control of these observation beds; they act also as general liaison officers between the Ministry of Pensions and the tuberculosis officers of the country, and are more or less directly concerned in all that affects the pensioner, officer, nurse or man, who has, or who claims to have, entitlement for tuberculosis, pulmonary or surgical.

A time limit of 28 days is set for the period of observation, and the average stay of each case is about three weeks. Thus every three or four weeks for the past two years some 150 cases of doubtful

tuberculosis have been systematically investigated by a standard routine by the Ministry, and the results recorded in a comparable manner. It will be seen that in this direction the Ministry of Pensions has been and is carrying on work which, in addition to its great value to the Ministry itself, is providing most valuable information for all tuberculosis workers and to an extent never previously accomplished in this country.

It is not as yet either possible or desirable to set out the total results of the work throughout the country, but the facts and figures which Dr. Price submits are fully representative of the results obtained by his colleagues elsewhere, and the deductions he makes from his experience are largely justified and strengthened by their experience also. The Ministry's regulations are, naturally enough, not easily understood by those who touch its work at the periphery only, and to whom it is neither a duty, nor can it be a pleasure, to seek to fathom the intricacies of pensions administration. Such intricacies are the inevitable accompaniment of so gigantic an organisation, started as it was in time of war and faced with problems hitherto unknown and with complications unpredictable. The Deputy Commissioners of Medical Services (Tuberculosis) are the interpreters to tuberculosis officers of these intricacies; in this liaison work they have been of real service. The duty and responsibility of the Ministry of Pensions as regards those receiving or claiming pension for tuberculosis is complementary and supplementary to that of the tuberculosis officer. The Ministry must satisfy itself that the diagnosis is clear because it is the authority that must meet the cost of pension and treatment if "entitlement" is granted; it must be the authority for deciding on "entitlement" since with it alone are the full war records of each case; and it must provide the necessary treatment when, as in the case of officers and in certain areas surgical tuberculosis cases, the treatment is not normally provided by the existing schemes of local health authorities.

II. REVIEW AND ANALYSIS OF CASES.

BY DR. PRICE.

Amongst discharged soldiers diseases of the respiratory system occupied a prominent position, as was indeed to be expected. The use of poisonous gases in warfare had introduced a new factor in the causation of respiratory diseases, and prolonged exposure in trench warfare through all seasons of the years, combined with periods of comparative inactivity in the worst conditions of climate and life, were important predisposing causes. A relatively large number of men were thus "invalided" for the sequelæ of gas poisoning, and for types of respiratory affections also common in civil life, particularly tuberculosis. In June, 1923, there were nearly 40,000 pensioners suffering from tuberculosis, including some 3300 non-pulmonary cases.

The symptoms of a depreciated physical state, loss in weight, chronic cough with sputum, reputed "coughing up of blood" (a statement which obtains in many cases a too ready credence), and on examination, the presence of slight physical signs—e.g., crepitations, probably more marked or persistent in one lobe of a lung than another—were common enough in these men returned from the war, and thus it is easy to understand that diagnoses of tuberculosis were made in a great number of cases. Hospital accommodation, moreover, was taxed in all directions at the time, and systematic observation was impossible for checking the diagnoses. In addition, medical opinion tended to assume that men who had suffered exposure to gassing would, a priori, be more prone subsequently to develop tuberculous infection. In men returning from the East, debilitated by malaria and dysentery, the transient chest symptoms, present in many on return to a colder climate and English winters, were viewed more gravely than after-experience proves to have been necessary.

Again, soldiers returning from abroad were anxious to be demobilised without delay, and a large number failed to make proper use at the time of discharge of the opportunity afforded for claiming consideration for disabilities they considered to be then present. Many, too, feeling comparatively fit on return, did not foresee the possibilities of a failure in health. Following the vicissitudes of civil life—unemployment and deprivation to some extent of the necessities of life—old symptoms returned, or slight conditions of ill-health became emphasised and more pronounced. A constant series of new claims therefore came to be considered; and though the lapse of time will eventually end these fresh claims, the Ministry must give full consideration to them, and their possible relationship to service. Many doubtful cases thus need to be investigated, and arrangements have been made for selected hospitals to provide accommodation for their adequate examination.

The pensioners admitted for this purpose from what is known as the London Region (bounded roughly by a line drawn across the map from the Wash to the Solent or Channel Islands) go to the Ministry of Pensions Hospital, Orpington, where 80 or more special observation beds are available as required, together with complete facilities for laboratory and X ray investigations. A visiting staff of specialists is also available for consultation.

It is proposed here: 1. To outline briefly the scope and methods of the investigations. 2. To give a brief analysis of the first 500 cases investigated, with comments on the factors of gassing, gunshot wounds of chest, and syphilis in relation to the incidence of tuberculosis and other chest disabilities. 3. To estimate and comment on the relative value of special methods of research; comparing the results of clinical, pathological, and X ray findings.

1. *Scope and Methods of Investigation.*

The importance of as thorough an examination as possible was quickly realised; any disabilities that might subsequently arise would then be more definitely dated as to time of origin, and the connexion or non-connexion with the invaliding disability more readily established.

The examinations are divided into three sections, all of which are carried on more or less concurrently: (1) Clinical; (2) pathological; (3) radiographical.

1. *Clinical Investigations.*—On admission the pensioner is kept in bed for the first four days, during which period rectal and mouth temperatures are recorded four-hourly. Subsequently, when the patient is up and about, the temperature (rectal) is taken only night and morning. An attempt has been made roughly to gauge the effects of exercise on body temperature, provided the case is suitable, by arranging for three exercise-temperature tests. During the warmer weather, 20 minutes fairly heavy work is provided, under supervision, in the grounds of the hospital, such as digging, rolling, or other equivalent. In unsuitable or cold weather, physical exercises are carried on in the gymnasium. Immediately on the completion of this exercise the men return to their ward, are kept in bed an hour, during which the rectal and mouth temperatures are taken at half-hourly intervals, until the temperature has reached a normal level; observations on the pulse and respiration are also noted.

Each case is under daily clinical observation by a resident medical officer who has had special experience in chest work and who makes full notes of his frequent examinations. The final clinical report is thus based not on a single observation, but upon a series of examinations, which are of great service in determining the persistence or transient nature of certain physical signs. Every region of the body is overhauled, and any symptoms, even apparently alien to the disability actually in question, are followed up to elucidate any possible inter-relationship. Thus, fractional test-meals, barium meals, examination of resting gastric juice for tubercle bacilli, sigmoidoscopic and cystoscopic procedure (including examination of ureteral urine) may all on occasion be required.

For the conclusions embodied in the final reports the Deputy Commissioners in Tuberculosis are personally responsible after their own examination of the man, and these reports are made after the clinical findings have been corre-

lated with the findings from other departments, and the case viewed in the light of all available evidence.

2. *Pathological Investigations.*—When sputum is available, at least five examinations are made from the morning sputum, or from a 24-hour specimen to determine the presence of tubercle bacilli. As a rule the first test is made using the antiformin method, as in many cases the pensioners have had a fairly long journey, which may excite a slight rise of temperature and a freer expectoration of sputum. In addition, the complement-fixation test for tuberculosis is carried out, and the Wassermann reaction noted for purposes of control. Von Pirquet's tuberculin skin reactions are tried; tuberculin O.T. (human), as supplied by Burroughs and Wellcome, being used in dilutions of 1–10, 1–100, 1–500 with a control; special attention is given to the area and depth of infiltration resulting.

In making the film examinations for tubercle bacilli the possible presence of spirochætosis, mycelial or other infection is kept in mind. One case of nocardial infection, for instance, was found, presenting an interesting clinical state and peculiar sputum characters; the condition had for some years been regarded as tuberculosis. Elastic tissue fibres have rarely been found in the type of case under observation. Sputum albumin has been estimated as a routine observation, so that the results might be compared in parallel with other tests. The urine is fully tested at least twice, and if pus cells are present or urinary symptoms occur, the urine is also examined for the presence of tubercle bacilli. Tubercle bacilli have occasionally been found in the stools when absent from other discharges. Animal inoculation is occasionally required. Laryngological, aural, nasal examinations are made by the consulting laryngologist attached to the hospital.

Diagnostic tuberculin is not now employed. The risk of revival of an apparently arrested or quiescent infection cannot be ignored and the Ministry considered that such a risk was not justifiable.

3. *Radiographical Reports* from screen and film examinations are included in all cases.

[2. *Analysis of 500 Cases Admitted for Investigation.*

While diagnosis of a suspected tuberculous lesion is, as a rule, the main problem confronting those responsible for the investigations, it is by no means the only one. Thus it is frequently stated that information is needed as to whether the patient has tuberculosis or has *ever* had it; if present, how long has it existed, and is the condition connected with service? It is appropriate here to point out that whilst a private doctor or even a tuberculosis officer can alter his diagnosis at will according to the variations in the evidence from time to time, the Ministry, once having accepted a definite diagnosis and granted an entitlement thereon, must require very definite contrary evidence before it can officially alter the diagnosis. Mere suspicion and doubt of a diagnosis are not adequate when considerable issues (often of a financial character) affecting the pensioner are involved.

Continued entitlement for tuberculosis does not imply necessarily that continued treatment is required, but simply that the pensioner has been accepted by the Ministry as one who has present, or has had past, disease. On the other hand, it is to be noted that a phrase is often found in reports from tuberculosis officers to the Ministry to the effect that a pensioner has no *active* tuberculosis, or has no evidence of *present* tuberculosis, and this, though probably not meant to imply "no past disease," is open to such interpretation. Misunderstandings at times have occurred, and these would be obviated if this kind of statement was amplified to make clear the opinion as to past disease. Of the 500 cases referred to, 243 had entitlement for pulmonary tuberculosis, and of these 37 had records of tubercle bacilli having been found at least once, the remaining 206 had been diagnosed on clinical grounds, and there were no records of tubercle bacilli having ever been found present in the sputum.

As will be best seen from the attached table eight out of the 37 were still T.B.+, and one was clinically active; 20 showed a quiescent condition, while in eight cases there were grounds for considering that the diagnosis should have been a non-tuberculous condition.

Results of Investigation.

A = Number of cases investigated.
B = Tuberculosis, T.B. positive.
C = Tuberculosis active, T.B. negative.
D = Tuberculosis quiescent, T.B. negative.
E = Bronchitis, asthma, fibrosis.
F = Fibroid pneumonia and other non.-Tb. conditions.
G = Nil disability.
H = Syphilitic conditions.
I = Cystitis.
J = Diagnosis unaltered.

Invaliding disability.	A	B	C	D	E	F	G	H	I	J
Tuberculosis—										
T.B. pos. (pulm.) ..	37	8	1	20	7	1	—	—	—	—
T.B. neg. (pulm.) ..	206	13	5	101	75	1	6	5	—	—
Fibroid phthisis	28	1	1	10	10	5	1	—	—	—
Bronchitis, fibrosis, &c. ..	79	3	1	23	51	1	—	—	—	—
Non-pulm. tuberc. ..	23	10 S*	—	—	—	11	1	—	1	—
Non-tuberc. lung conditions	3	—	—	—	—	3	—	—	—	—
Gunshot wounds—										
F.B. not retained ..	12	—	2	2	3	—	—	—	—	5
F.B. retained	8	1	—	1	2	—	—	—	—	4
Surface chest wounds ..	7	1	—	1	—	—	—	—	—	5
V.D.H.	7	1	—	—	1	—	—	—	—	5
D.A.H.	8	—	1	3	3	—	—	—	—	1
Pleurisy	9	3	—	4	1	—	—	—	—	1
Effects of gassing ..	14	—	—	2	12	—	—	—	—	—
Debility	20	1	—	4	10	4	1	—	—	—
Tuberc. laryngitis ..	1	1	—	—	—	—	—	—	—	—
Non-tuberc. ,, ..	1	—	—	—	—	—	—	—	—	1
Trench fever	1	—	—	—	1	—	—	—	—	—
Malaria	14	1	1	4	5	1	—	—	—	2
Nephritis	4	—	—	—	—	—	—	—	—	4
Pneumonia	1	—	—	1	—	—	—	—	—	—
Rheumatism	1	—	—	—	—	—	—	—	—	1
Chronic synovitis ..	2	1	—	—	—	—	—	—	—	1
Renal calculus	1	—	—	—	—	—	—	—	—	1
Empyema	3	1	—	—	—	2	—	—	—	—
Neurasthenia	3	—	—	1	—	1	—	—	—	1
Hæmoptysis	4	2	—	2	—	—	—	—	—	—
Gastric ulcer, gastritis ..	2	—	—	—	—	1	—	—	—	1
Dysentery	1	1	—	—	—	—	—	—	—	—
Totals	500	49	12	179	181	31	9	5	1	33

* S = surgical.

As regards the 206 cases of pulmonary tuberculosis in which tubercle bacilli were never previously found, in 13 tubercle bacilli were discovered in the sputum, or in one or other of the body discharges. In one of these cases clumps of an acid-fast bacillus, considered to be the tubercle bacillus, were recovered from the resting juice of the stomach, though not obtained from the sputum. There are, of course, fallacies to consider in such a method, but, on the other hand, when correlated with other clinical and special evidence, the result may be of importance. Five other cases were clinically active, whilst 101 cases showed evidence compatible with quiescent or in some cases arrested disease. In 75 it was considered the diagnosis should be altered to chronic bronchial affections, associated with varying degrees of fibrosis, asthma, or bronchiectasis. Five had conditions probably of syphilitic origin, one of which had special (venereal disease) treatment in a civil hospital by arrangement and materially improved. Fibroid phthisis was the invaliding disability in 28; this condition seemed particularly common in men coming from the Navy, many of whom were stokers. In only one of this group were tubercle bacilli found whilst under observation, one had clinically active tuberculosis, ten were quiescent, and in 16 practically no alteration in the diagnosis was made.

Of 79 cases admitted under the labels of chronic bronchitis, bronchitis and asthma, bronchitis and fibrosis, bronchiectasis, &c., but in whom tuberculosis was suspect, three had tubercle bacilli in the sputum, one showed tuberculous activity, 23 gave evidence of quiescent foci, largely masked by secondary conditions, and in 52 the diagnosis remained as before.

Epitomising therefore: Of 243 cases admitted with reputed and "entitled" tuberculosis 21 still showed tubercle bacilli positive (9 per cent.), six showed activity (2·5 per cent.), 121 (50 per cent.) showed evidence of old quiescent or arrested lesions, while in 95 (33 per cent.) there was no clear evidence of present or past tuberculosis. The non-pulmonary

tuberculosis cases numbered 23; of these ten remained unaltered in diagnosis, 13 were found non-tuberculous.

The various conditions (non-tuberculous) in which tuberculosis had been suspected make a lengthy list. The final results in the 500 cases are as follows:—

	Per cent.
Tubercle bacilli discovered in sputum or discharges (this includes ten surgical, decided on clinical grounds) ..	9·8
Active pulmonary tuberculosis, but no tubercle bacilli found	2·4
Quiescent or arrested pulmonary tubercle (the majority with secondary bronchitis and fibrosis)	35·8
Insufficient present evidence on which to diagnose tuberculous infection	52·0

Syphilitic Infection and its Relation to Chest Disabilities.

The Wassermann reaction carried out as a control to the complement-fixation test proved to be positive in 44 cases out of 500—that is to say, 9 per cent.; few of these showed overt symptoms of syphilis, though an actual history of past venereal disease was obtained from a good many. In these 44 cases, 41 had a double plus reaction, and three a single plus or weak reaction. Tuberculosis was present in ten of the 44, three had tubercle bacilli in sputum, one had active tuberculosis but the sputum contained no tubercle bacilli, six had quiescent tuberculosis, one had doubtful tuberculous or syphilitic lesion of the lung, seven had marked pulmonary fibrosis probably of specific origin, 18 had chronic bronchial conditions with fibrosis, most of these showed considerable debility, five had non-pulmonary lesions.

The object of drawing attention to this specific infection as being present in 9 per cent. is to emphasise the probability of it being a marked factor in the persistence of debility accompanying the various chest conditions. A few cases who have placed themselves under treatment, and whose histories it has been possible to follow up, have shown decided improvement in their chest disabilities.

Tuberculosis and Gassing.

The early gas attacks of the Germans began in April and May, 1915. Chlorine was the gas first employed, released from cylinders, and allowed to drift when a favourable wind was blowing. Later, in 1915 and in 1916, lacrymatory gas shells were also in use. In 1916–17 more lethal gases such as phosgene ($C.O.Cl_2$), chlor-methyl and trichlor-methyl-chloroformate, chloropicrin ($C.Cl_2NO_2$) and others were utilised, and in 1917–18 in addition mustard gas (di-chlor-ethyl sulphide) and various arsine compounds were used singly and mixed. Those mentioned are all lung irritants, and in one example also vesicant. The immediate results and the pathological changes resulting in intense œdema of the lungs, rupture of the alveolar walls, patchy emphysema and thrombosis of capillaries are so well known and described by Edkins, Shaw, Dunn, Winternitz, Soltau, and in the official history of the war, Vol. II., that no full reference here is needed. As regards later and remote effects, it is probable that more knowledge will be forthcoming. The French mention cicatricial changes in the lungs, bronchiolitis obliterans, and bronchiectasis as later after-effects; also local thrombosis in the lungs, or more remote organs such as the brain and kidneys.

Of 188 Canadians investigated four years after being gassed, 54 showed no ailment; 78 had irritable heart; 26 had bronchitis and asthma; 18 had neurosis; and 12 were not traced. No case of this series had proved pulmonary tuberculosis, though several showed prolonged low fever, loss of weight, profuse perspiration, similar to those termed by Achard and Flandin as pseudo-tuberculosis.

Reference has been previously made to the early predictions that tuberculous developments would be common in gassed cases, but general experience has negatived this presumption. In the analysis of the 500 cases under investigation it thus came rather as a surprise to find the incidence of proved tuberculous infection and quiescent disease was much higher than in the Canadian and other statistics. It must, however, be remembered that all the cases investigated at Orpington are selected cases, with lung symptoms, in whom tuberculosis is already suspected or had been diagnosed. Such figures as are here given would have, therefore, to be corrected against the incidence of tuberculosis in the average industrial population, and correlated with the percentage of tuberculosis in a sample series of all pensioners who had been gassed. The "gassed" cases numbered 92 out of the 500. They are divided into two groups: (1) in which official records prove the pensioner to have been admitted to hospital for effects of gassing; (2) when there was no official record, but the patient volunteered the statement that he had been gassed, but only requiring regimental treatment was not admitted to hospital, and was able to return to duty after a brief period. Obviously these cases were light and the gassing could hardly be expected to leave permanent after-effects.

Group 1. (70 Cases.)

	Cases.
Documentary evidence of tubercle bacilli in the sputum before this investigation	8
Tubercle bacilli discovered in the sputum for the first time while under observation	4
Evidence of tuberculosis (active) but T.B. negative ..	1
Apparently quiescent lesions and T.B. negative. (These probably correspond to the pseudo-tuberculosis cases of other writers)	17
Non-tuberculous conditions, principally bronchitis, emphysema, asthma	34
No chest disability	6

Group 2. (22 Cases.)

	Cases.
Evidence of active tuberculosis and tubercle bacilli were present in the sputum	3
Evidence of quiescent tuberculosis, T.B. negative ..	3
Various bronchial conditions (non-tuberculous)	15
No pulmonary disability	1

There is therefore a heavier incidence of positive and active cases in Group 1 as compared with Group 2.

In the total of 92 gassed cases 16 cases (17·4 per cent.) were active or had been suffering from active tuberculosis. Twenty cases, or 21·4 per cent., showed evidence of quiescent disease, but had always been, so far as records showed, T.B. negative.

The diagnosis in these cases is a matter of opinion, but in this series it would appear that 38·8 per cent. of gassed cases gave evidence of tuberculosis, active or quiescent. The fact already mentioned that the whole 500 cases investigated are "selected" probably explains this high figure, which cannot therefore be taken to apply to gassed cases as a whole. Of the 14 cases admitted for "effects of gassing" none showed active tuberculosis or positive sputum, two gave signs of quiescent disease, and 12 were suffering from non-tuberculous bronchial conditions. Previous to March, 1920, "gas" cases were included in the Ministry's statistics under the heading of "chest complaints," this heading also included tuberculosis and bronchitis, the total being 95,132 up to March 31st, 1920; from that date a further 2604 "gas" cases have been awarded pension.

It will readily be recognised, therefore, that the results obtained in these 92 cases suspected of having tuberculosis form no definite criteria as to the incidence of tuberculosis in the total number of gassed cases.

Gunshot Wound of the Chest and Tuberculosis.

Schuller's early experiments on animals demonstrated the apparently direct influence of traumatism in localising and developing tuberculosis in bones and joints. Achard, V. Friedländer and others, repeating

these experiments under stricter conditions, came to different conclusions. The rôle of traumatism is generally considered to be limited in its relation to the development of tuberculosis. More recently Imber, Oddo, and Chavarnac in their "Accidents du Travail" have again drawn attention to the subject, and definitely consider that traumatism may induce by inoculation a localised tubercle, aggravate existing or latent tubercle, or even cause a generalisation of pre-existing tubercle. Severe and extensive injuries, they state, are not followed by tuberculosis nearly so frequently as injuries provoking less severe reactions. War experience tends only in general to corroborate this view. They, however, quote Sergent, Bernard, and Challamel in support, and consider that wounds of the chest producing little immediate effects may several years later be the starting-point of pulmonary tuberculosis.

These considerations therefore lend interest to the 27 cases of gunshot wound of chest in our series suspected of having tuberculosis. I have grouped them into three classes.

1. Foreign body not retained (penetrating wound)	12
2. ,, ,, retained ,, ,, ...	8
3. Surface, non-penetrating wounds	7

In Group 1 the diagnosis of sequelæ of gunshot wound (chest) remained unaltered in five, in two evidence of active tuberculosis (sputum negative) was present, two showed evidence of quiescent (tubercle bacilli negative) tuberculosis, and three had broncho-fibrotic (non-tuberculous) conditions.

In Group 2 one case was found to have positive sputum, one showed quiescent tuberculosis, and three were of the bronchitic (non-tuberculous) type, while four remained unaltered in diagnosis.

In Group 3 one was tubercle bacilli positive, one quiescent, and five were unaltered in classification.

The frequent and persistent recurrence of hæmoptysis in these cases is a disturbing feature, and is the main cause for suspicions of tuberculosis being aroused. There are some clinical considerations with regard to hæmoptysis (recurrent) in gunshot wounds of the chest which are worth discussing. Unless there is an obvious irritant retained, the hæmoptysis in gunshot wounds of the chest tends to improve as years go by. It may be completely absent while the patient keeps at rest or uses a minimum of exertion. As soon as he tries to get about to live a more ordinary life and exposes himself to physical stress the hæmoptysis is apt to recur and is somewhat proportional in severity to the exertion apparently exciting it.

Tuberculosis, as these figures show, may supervene, and cases do occur which present very puzzling problems as to whether it is the tuberculous infection or other sequelæ of the original traumatism which are responsible for the hæmoptysis and existing condition.

3. *Relative Value of Clinical, Pathological, and Radiographical Evidence in Investigations of Suspected Tuberculosis.*

It has been a matter of considerable interest to compare, side by side, the clinical, pathological, and X ray evidence of tuberculosis in the 500 cases under observation. Apart from the presence of tubercle bacilli being demonstrated in the discharges, it was hoped that the complement-fixation test would be capable of development and prove to be a test comparable in certainty to the Wassermann. These hopes have not been realised to the extent hoped for, though the complement-fixation reaction may be decidedly helpful in suggesting the probable infection responsible for dubious clinical signs. At times, however, it is negative even when undoubted infection is present, or is perversely positive in apparently non-tuberculous cases. Besredka's antigen was used throughout; it has varied in sensibility at times, depending probably on questions of technique in preparation. This antigen is obtained by culture of tubercle bacilli in media containing yolk of egg. The four days' old culture is killed at 120° C. An emulsion is then prepared and shaken up so as to obtain a homogeneous preparation.

In the following analysis the degree of reaction has been classified as follows:—

Deviation.

(1) Under 1	minimum	hæmolytic	doses ..	negative.
(2) 1–2	,,	,,	,, ..	doubtful.
(3) 3–4	,,	,,	,, ..	positive.
(4) 4–5 or over	,,	,,	,, ..	strong positive.

The end-results obtained are here quoted.

The reaction was obtained in 124 cases as follows:—

Strong Positive, 27. Eight of these were tubercle bacilli positive; 1 was negative as to tubercle bacilli, though showing active symptoms and signs; 15 had quiescent tuberculosis; and 1 was surgical tuberculosis; the remaining 2 were not considered to be tuberculous.

Positive, 77. Of these 9 showed tubercle bacilli in sputum; 7 were active, but no tubercle bacilli were demonstrated; 52 had quiescent disease (3 originally being tubercle bacilli positive); 1 was a surgical case (joints); 8 were not considered to have tuberculosis.

Doubtful Reactions, 20. Three were tubercle bacilli positive; 12 had quiescent or arrested conditions; 5 were not considered to have tuberculosis.

It is to be remembered that positive Wassermann reactions were *not* present to complicate the findings in these cases. The total result therefore is:—

Positive or Doubtful Complement-Fixation Reactions, 120. Twenty tubercle bacilli positive; 8 tuberculosis active, but tubercle bacilli negative; 79 quiescent, negative (2 surgical tuberculosis); 15 non-tuberculous.

Negative Complement-Fixation Reactions, 118. Five had tubercle bacilli positive; 10 had active clinical signs and symptoms of tuberculosis; 100 were considered to have quiescent tuberculosis; 3 cases of genito-urinary tubercle also positive.

These results give the following percentages as regards the presence of complement fixation:—

(*a*) In known pulmonary tuberculosis (tubercle bacilli present) C.F.T. was positive in 80 per cent. of cases.

(*b*) In clinically active pulmonary tuberculosis (tubercle bacilli negative) C.F.T. was positive in 44 per cent. of cases.

(*c*) In quiescent pulmonary tuberculosis (tubercle bacilli negative) C.F.T. was positive in 44 per cent. of cases.

(*d*) In clinically non-tuberculous conditions C.F.T. was positive in 10 per cent. of cases.

The complement-fixation reaction may be also positive in varying degree in non-tuberculous cases. In this connexion one case may briefly be quoted because of its special interest due to verification by post-mortem.

Pensioner C. was a case of a long-continued irregular pyrexia—wasting, indefinite pains and discomfort in chest and abdomen, with at times chest symptoms of minor degree. The complement-fixation reaction on repeated examinations was found strongly positive over a period of time. The associated clubbing of fingers, with slight pulmonary signs at one apex, and later rapidly developing signs at one base seemed indicative of tuberculosis. No direct demonstration of tubercle bacilli could be made, but in spite of most thorough investigation alternative causes of disease could not be recognised, or visceral lesions found. Originally, he had suffered from malaria, when on service in the East. At the post-mortem, actinomycosis of kidneys, liver, and base of lung was found; a small calcareous and caseous (tuberculous) gland was present near the appendix and a healed fibrotic apex (tuberculous) of one lung, showed old infection with tuberculosis.

The following are some conclusions, based on the present analysis, as to the value of the complement-fixation test with Besredka's antigen (other antigens, including Punch's method of preparation, have only been used in a very few cases):—

1. A strong positive reaction suggests a tuberculous infection, but the degree of reaction is not necessarily proportional to the clinical condition and may be pronounced with a quiescent state of disease. A persisting and strong positive reaction should cause the clinical signs and symptoms

to be carefully scrutinised if tuberculosis is not clinically definite. Single observations, while suggestive, cannot be regarded as conclusive. Variation in results does occur, if the test be repeated at intervals.

2. A positive (weak) result does not give any decided indication in favour of tuberculosis though it may be a link in evidence when the type of infection is dubious.

3. The presence of a positive Wassermann much impairs any deductions from a complement-fixation test unless the complement-fixation test is of higher value than the Wassermann.

Sputum albumin was estimated in most of the cases, the sputum was shaken with three parts water, filtered, and boiled with acetic acid. The degree of albumin present was of no real help in estimating the presence of tuberculosis, nor did its absence exclude quiescent conditions.

Von Pirquet skin reactions were consistently carried out in a large number of the cases, Koch's old tuberculin being used in dilution 1–10, 1–100, 1–500, with a control. A scarifier was used in applying it to the skin. No consistent results were obtained in relation to the complement-fixation test; often-times the results were mutually contradictory. The skin reaction was absent in a number of cases diagnosed as tuberculosis, active and quiescent, including several with tubercle bacilli in the sputum or discharges.

Cultures from the sputum in a number of cases in which the bronchitic condition was emphasised showed the presence of an anaerobe described by Castellani, Douglas, Thompson. In these cases, some of whom had to be retained for treatment afterwards, vaccines containing the anaerobe caused very considerable improvement while remaining in hospital.

Radiographic Findings.

With reference to radiographic findings, in 127 cases the reports provided evidence tending to corroborate the positive clinical findings of tuberculosis. In other 66 cases, however, in which the clinical findings showed the presence of tuberculosis (including six tubercle bacilli positive, and five active but tubercle bacilli negative), the radiographic reports did not indicate the presence of tuberculous conditions and the lungs were reported as having slightly or no abnormal features present. While the accessory value of these examinations is very valuable, to obtain maximum benefit from X ray findings it is desirable that:—

1. A more uniform nomenclature by radiologists should be in use, particularly in the meanings they attach to the much-abused word "fibrosis."

2. Fuller appreciation by the radiologist of the clinical aspect of the case and past history of the patient would often tend to prevent the apparent contradiction of clinical and radiographical evidence.

3. In collaborating for investigation it is well for one radiologist to be responsible for X ray findings so as to secure uniformity in the consideration of films. It is not unusual to find diverse reports on the same patient within a brief period of time, when different radiologists are concerned in the readings.

Perhaps in no part of X ray work does experience in reading chest films and screen work more greatly enhance the value of the reports. It is perhaps well to recognise that no case of pulmonary tuberculosis which has been already diagnosed on cogent evidence should be considered non-tuberculous because the X ray may not corroborate this finding.

In conclusion, while each section of the investigation may contribute valuable information and provide links in the chain of evidence, in the end it would appear that apart from finding tubercle bacilli in sputum or discharges reliance must chiefly be placed on clinical evidence.

We are indebted to the Director-General of Medical Services of the Ministry of Pensions for permission to publish these papers.

HYPERGLYCÆMIA AND GLYCOSURIA IN ACROMEGALY.

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WITH PATHOLOGICAL REPORT BY PROF. HUBERT M. TURNBULL, M.D. OXF.

(From the Medical Unit, London Hospital.)

THE discovery of insulin, with the resulting proof of the pancreatic origin of diabetes mellitus, has given an impetus to the study of the other forms of disturbance of carbohydrate metabolism which lead to glycosuria. Of these, one of the most interesting is the glycosuria which often accompanies acromegaly, a severe example of which is the subject of this report.

A Case Related.

J. S., female, aged 42, was admitted to the London Hospital Feb. 10th, 1921. The patient was a typical acromegalic. She first complained of headache in 1914. Enlargement of the extremities was first noticed in 1916. She was admitted because of unbearable headache and rapidly progressing optic atrophy with loss of vision.* Thirst was first noticed eight months before admission, it became intense, and her doctor discovered sugar in the urine. In spite of restricting her sugar intake, this thirst had persisted.

Condition on Admission.—The urine contained 10 per cent. of sugar and acetone bodies in large quantity; the blood-sugar was 0·43 per cent. Dietetic treatment was begun on Feb. 22nd, 1921, and the urine became sugar-free after three days' fasting. The diet was then gradually increased until by March 17th the patient was taking 83 g. of carbohydrate, 44 g. of protein, and 76 g. of fat, totalling 1200 calories. She was then transferred to the surgical ward for operation. Under intratracheal ether followed by intratracheal gas and oxygen anæsthesia, hypophysectomy was performed by Mr. Walton on March 19th, and a large soft pituitary tumour removed by the frontal route. Following operation the patient was desperately ill, with rapid pulse and shallow rapid respirations. She, however, gradually improved and made a slow but steady recovery. No symptoms suggesting coma occurred at any time and, in spite of the prolonged anæsthesia, the urine on the day following operation contained only a trace of sugar. Three days after operation the patient was put on a light diet containing milk, eggs, fish, bread, and potatoes; the urine remained free of sugar. On April 8th the blood-sugar was 0·15 per cent. The patient was discharged on April 19th, with instructions to avoid carbohydrate excess and to carry out frequent examinations of the urine for sugar. Prof. Turnbull's report on the tissue removed at operation will be found in an appendix to this paper.

The patient was next seen on July 8th, 1921. Her general condition was much improved; her headache much less severe, and her eyesight very much better. She said that she had been adding no sugar to her food at table but otherwise had followed an ordinary diet. The urine had been examined once or twice a week, sugar had never been detected. Her blood-sugar was 0·12 per cent.

Readmission to Hospital.—In May, 1922, the patient was readmitted. Her general condition was excellent, but she still complained of a gnawing sensation in the right side of the tongue, a burning sensation in the inner canthus of the right eye, a throbbing, stabbing pain in the right temporal region, and a dull, aching pain in the right sub-occipital region. She also complained of nasal obstruction. The patient had continued to take any food she fancied, but had not added sugar; she had continued the periodic examination of the urine but had never detected glycosuria. The blood-sugar on May 5th was 0·13 per cent. A submucous resection of the septum was performed, with removal of part of the right middle turbinate.

She was again admitted to hospital on Jan. 3rd, 1923. For some months she had referred the pains in the head to a lump in the right side of the neck, where a rounded swelling, suggesting a gland, could be felt deep in the right anterior triangle. There was no glycosuria; the blood-sugar was 0·15 per cent. On Jan. 4th Mr. Walton operated and discovered a rounded tumour ½ in. by ¾ in. lying at the base of the carotid artery, deep to both internal and external

* A detailed description of this patient will be found in the report of the surgical aspects of the case by Mr. A. J. Walton, THE LANCET, 1921, i., 1168.

branches and firmly attached to the artery. With some difficulty it was freed from the artery and surrounding tissue and removed entire. After removal it formed a pinkish-white rounded tumour of the consistency of a lymphatic gland and was, apparently, completely encapsulated. The patient made an uneventful recovery and was discharged from hospital on Jan. 17th. The report on the excised tissue, which proved to be a mixed neuroblastoma and embryonic neuroma of the carotid body, will be found in the appendix.

On August 10th, 1923, the patient again reported for examination. She still complained of pain in the head and neck deep in "at the root of the tongue." Her general condition was excellent. The urine was free from sugar, but a sugar tolerance test showed the following definitely diminished carbohydrate tolerance: Blood-sugar before glucose, 0·14 per cent.; blood-sugar ½ hour after 50 g. glucose, 0·27 per cent.; blood-sugar 2 hours after 50 g. glucose, 0·22 per cent.

At the time of writing, three years after the operation, the patient's condition is unchanged. She still complains of pain in the head and neck and has recently suffered from photophobia. Careful examination has failed to reveal any evidence of extension of the growth into the sphenoidal sinus or alteration in her physical state. It is clear that she is emotionally unstable and, to some extent, the victim of an unwise and excessive sympathy in her domestic circle. The urine is free from sugar, but there is some hyperglycæmia. A sugar tolerance test has shown results practically identical with those of the previous examination, a definitely diminished carbohydrate tolerance: Blood-sugar before glucose, 0·18 per cent.; blood-sugar ½ hour after 50 g. glucose, 0·22 per cent.; blood-sugar 2 hours after 50 g. glucose, 0·23 per cent.

The glycosuria of acromegaly is usually small in amount and a cause more of curiosity than alarm. As will be seen by the case here reported, it may, however, attain the proportions of a true diabetes, and in the literature can be found reports of cases showing all the symptoms and complications of that disease. Observations on the blood-sugar in patients with acromegaly are difficult to find; in our patient a marked hyperglycæmia was present, the blood-sugar on admission being 0·43 per cent. Though ketonuria is stated to be rare in acromegaly, Froment [1] has been able to collect a dozen instances in the literature, in which death from typical diabetic coma has ensued. In our patient a well-marked ketonuria was present, the acetone bodies in the urine measuring 0·2 per cent.; no symptoms of ketosis were present; the plasma bicarbonate was 66. It is generally stated, perhaps on somewhat meagre evidence, that the glycosuria of acromegaly is singularly insusceptible to changes in diet; in our patient no support for this statement was found, the urine became sugar-free on fasting as rapidly as would be expected in a true diabetes of equal severity.

Various Theories Examined.

The severity of the diabetes in this patient and its relief following hypophysectomy stimulate a consideration of the nature of the disturbance of carbohydrate metabolism existing in acromegaly, and of the rôle of the pituitary body in its production. The recognition of the frequent association of acromegaly and glycosuria dates from a paper by Hanseman in 1897. Hanseman [2] analysed the reports of 97 cases of acromegaly, and called attention to the occurrence of glycosuria in 12. Hinsdale [3] in the following year reported 14 instances of glycosuria in 130 acromegalics, while Borchardt [4] in 1908 stated that analysis of the collected reports of 176 cases showed glycosuria in 63, and the presence of "alimentary glycosuria" in a further eight. Later studies, while not confirming the frequency of occurrence claimed by Borchardt, have established the common association of the two conditions. The demonstration by Goetsch, Cushing, and Jacobson [5] of the occurrence of glycosuria following handling and electrical stimulation of the pituitary body, and of the increased carbohydrate tolerance in animals after hypophysectomy demonstrated the influence of the gland on carbohydrate metabolism and supported the theory developed from clinical observations, that both acromegaly and glycosuria resulted from over-activity of the hypophysis.

The more recent investigations of Camus and Roussy, [6] of Aschner, [7] and of Bailey and Bremer, [8] have thrown some doubts on the correctness of this hypothesis. These observers produced destructive lesions of the nervous system in the region of the floor of the third ventricle. Care was taken to avoid injury to the hypophysis. They claim to have produced in this way, in animals, glycosuria, a polyuria simulating diabetes insipidus in man, and a condition of fat accumulation with an accompanying loss of secondary sexual characteristics, similar to dystrophia adiposo-genitalis. Camus and Roussy are of the opinion that these conditions, glycosuria, diabetes insipidus, and dystrophia adiposo-genitalis, are due not to disturbance of pituitary secretion, as has generally been contended, but to mechanical pressure on, or injury of, nervous centres in the base of the brain. Without minimising the importance of these observations, it can be stated that, as regards the origin of glycosuria, the evidence presented in support of this view is meagre. In none of the experiments, whatever the operative measure employed, was glycosuria, of a more than transitory character, set up, and nothing resembling the prolonged and severe glycosuria, seen in our patient, was ever produced. That there exist centres in the base of the brain which, when stimulated, lead by action through the sympathetic to increased breaking down of glycogen, and thereby transient hyperglycæmia and glycosuria, cannot be doubted. There is, however, little experimental evidence to suggest that a permanent diabetes can be produced in this way.

The clinical evidence is also against the hypothesis. If mere mechanical pressure on centres in the floor of the third ventricle were the factor responsible for glycosuria in acromegaly, then all tumours capable of exerting such pressure should equally produce it. There is much evidence to show that this does not occur. Thus Borchardt [4] states that in reviewing the entire medical literature from 1886 to 1908 he was unable to find a single case of hypophyseal tumour accompanied by glycosuria, unless acromegaly was also present. Froment [1] in a recent communication confirms this and states that in later literature he, likewise, has been unable to find examples of glycosuria in hypophyseal tumours unassociated with acromegaly. On the other hand, Anders and Jameson [9] have collected a number of instances of lesions of the pituitary body with glycosuria and without acromegaly. A careful analysis of these cases shows, however, that in the majority the glycosuria was transient or terminal, and associated with either marked intracranial pressure or injury to the base of the brain. Only one case in the series, that recorded by Sainton and Rol, [10] is really free from objection, and is insufficient to refute the claim of an essential relation between acromegaly and glycosuria. A stronger argument against the theory of a mechanical origin of the glycosuria than its association with acromegaly and its absence in other hypophyseal tumours is the fact that juxta-hypophyseal extra-sellar tumours and inflammatory exudates, though obviously most favourably placed for exerting pressure on the area of the brain in question, rarely lead to glycosuria.

A Possible Explanation.

It appears, therefore, that the available evidence is against pressure on nerve centres as the cause of glycosuria in acromegaly, and that the theory that these disturbances of metabolism are due to a disordered secretion of the pituitary body offers the most plausible explanation. The relatively satisfactory carbohydrate metabolism following removal of the hypophysis, in the case described above, suggests that in this patient the glycosuria was not due to pancreatic deficiency. How, then, can it be explained? A possible explanation is suggested by the experimental observations of Burn, and of Olmsted and Logan. Burn [11] has shown that in rabbits pituitrin markedly modifies the action of insulin, diminishing, or even preventing, the marked fall of blood-sugar which normally follows an injection of insulin in the

fasting rabbit. In rabbits rendered hypoglycæmic by insulin, a rise in blood-sugar followed the subcutaneous injection of pituitrin, comparable to that resulting from the administration of glucose. Burn showed, moreover, that this effect of pituitrin was not due to an increased breaking down of glycogen, as occurs when adrenalin is injected, but was apparently an action directly antagonistic to insulin. The results of Olmsted and Logan[12] also support this idea of an antagonistic effect of the hypophysis on the action of insulin. Their experiments are very suggestive, but a careful analysis of their protocols emphasises the highly artificial conditions under which they were made, and reveals the short duration of their observations on the effect of insulin in decerebrate cats with hypophysis intact. Further observations on this interesting apparent antagonism between pituitrin and insulin are obviously desirable, for it would seem to offer a possible explanation of the glycosuria of acromegaly.

In the appendix to this paper Prof. Turnbull suggests that the pars intermedia was the site of tumour formation in all of the ten cases of tumour of the glandular portion of the pituitary he has studied. In the past an over-activity of the anterior lobe has been held responsible for the development of acromegaly, but if Prof. Turnbull's view is a correct one, an over-activity of the pars intermedia would appear the more probable explanation. Such a hypothesis is in keeping with the idea we have suggested, that the cause of glycosuria in acromegaly is an inhibition of insulin action by increased pituitary activity, for pituitrin, though usually considered an extract of posterior lobe, is really an extract also of pars intermedia, no separation of these two structures being attempted, or indeed possible, in the commercial preparation of the extract.

There is, then, a considerable amount of evidence associating glycosuria with glandular overgrowth and over-activity of the hypophysis, and some evidence of an antagonistic relation between this gland and its product and insulin. This leads to the attractive hypothesis that glycosuria in acromegaly is due to an inhibition of normal insulin effect by excess pituitary activity. An attractive hypothesis is, however, always a source of danger to the unwary, the ground we are treading is highly contentious, and the whole subject of the pituitary body and its function is still wrapped in uncertainty.

Summary.

A case of glycosuria in an acromegalic patient shows the following points of special interest: (1) Severe hyperglycæmia, the blood-sugar on admission being 0·43 per cent.; (2) the successful accomplishment, after adequate dieting, of a major operation of prolonged nature, and the occurrence of only transient post-operative glycosuria; (3) the disappearance of glycosuria and hyperglycæmia following hypophysectomy and, although diminished carbohydrate tolerance is still present, the absence of glycosuria three years after the operation; (4) histological evidence suggesting the origin of the tumour in the pars intermedia; (5) the occurrence of a tumour of the carotid body.

The suggestion is advanced that the glycosuria of acromegaly is due to an increased activity of the hypophysis, probably the pars intermedia, with a resulting interference with the normal action of insulin on carbohydrate metabolism.

APPENDIX.

Pathological Reports by Prof. TURNBULL.

1. *Pituitary Tumour.*

The specimen (S.D., 460, 1921) was received on March 21st, 1921, and consisted of several small fragments of very friable tissue, mixed with red clot, in formaldehyde solution. The largest fragment measured 1 cm. in diameter, and consisted of pin-head granules of grey tissue mixed with blood. Another consisted of a membrane of yellowish-grey tissue with one slightly granular surface. The remainder appeared to be small portions of clot.

Microscopic Examination.—The two larger portions and some of the smaller were embedded in paraffin, and sections were stained in Ehrlich's hæmatoxylin with eosin, Weigert's iron-hæmatoxylin with van Gieson's mixture, the Unna-Pappenheim stain, Jenner's stain, and the Weigert-Gram stain with neutral red. In the largest fragment small areas in which spheroidal epithelial cells are packed round capillaries are separated by similar but dissociated epithelial cells mixed with red corpuscles. In the fragments which resembled clot a few small groups of similar epithelial cells lie among red corpuscles. The membrane is curved. Its convex surface is smooth; the concave surface is ragged, and upon it are some groups of epithelial cells similar to those in the other fragments. The membrane consists of a dense fibrous tissue, which encloses narrow acini. The long axes of the acini are parallel to the outer surfaces of the membrane. They contain a variety of cells such as are found in the anterior lobe of the normal pituitary body. The main part of the tumour is extensively disintegrated by hæmorrhage, but evidently consisted originally of a solid mass of epithelial cells traversed by capillaries. The membrane corresponds to a cap of compressed anterior lobe, such as we have found upon similar tumours removed entire at necropsy.

The spheroidal cells in the large fragment and in the portions of clot measure from 7 to 11 μ in diameter, the usual size being 8 μ. The nuclei are round, ovoid, or, less commonly, ovoid and curved. In cells measuring 8 μ in diameter they measure 6 μ. Most of the cells appear to be degenerate, the nuclei usually being excentric, whilst the cytoplasm has a ballooned appearance, being stained deeply towards the periphery alone. The nuclei resemble in structure those of epithelial cells in the normal pituitary body. The cytoplasm is distinctly basophil in sections stained with the Unna-Pappenheim stain, and is faintly basophil in Jenner's stain, but in sections stained with hæmatoxylin and eosin and differentiated for long periods in tap water, it has a greater affinity for the eosin than hæmatoxylin. The cytoplasm does not contain granules with an affinity for Gram's stain. Among these cells are a very few giant examples, which measure about 17 μ in diameter and contain three or four relatively small oval nuclei.

Some groups of similar spheroidal cells are present upon the concave or inner surface of the cap of compressed anterior lobe. Some of these groups are continuous with cells in acini within the cap. The majority of the cells within the acini are polygonal, and are larger, measuring from 9 μ to 14 μ in mean diameter. There are a few giant examples; for instance, a spherical, eosinophil cell measuring 40 μ in diameter and containing 14 nuclei. The cells are almost all chromophil cells containing granules with an affinity for Gram's stain; the eosinophil type is in great excess of the cyanophil.

Summary and Interpretation.—The pituitary tumour consists of epithelial cells, and has arisen either in the pars intermedia or in the posterior portion of the anterior lobe, a cap of compressed anterior lobe being present. Histologically the tumour is benign, the cells being very uniform and typical in appearance. The cells are very like the small, basophil, chromophobe cells of the gland, but the cytoplasm appears to be stained more readily and to be less distinctly basophil. A definite acinar arrangement is not present, the cells forming a continuous mass traversed by capillaries. The tumour cannot, therefore, be regarded as a "hypertrophy," if this term be defined as "an increase in magnitude without alteration in histological structure." "Adenoma" would appear to be the most appropriate designation. But I have obtained at necropsy a histologically similar tumour, capped anteriorly by anterior lobe, in which the spheroidal cells infiltrated not only the meninges but the substance of the brain. In the absence, therefore, of evidence concerning the histological relations of the margins of the tumour to adjacent tissues, "carcinoma" cannot be excluded. The capsule of compressed anterior lobe shows that the tumour arose either in the posterior part of the anterior lobe or in the pars intermedia. Since the year 1911 nine other tumours of the glandular portion of the pituitary body have been examined microscopically in the Pathological Institute of the London Hospital; one was associated with typical acromegaly, whilst four others were accompanied by structural changes possibly acromegalic in nature. Four of these nine tumours were removed at necropsy, and in all four a cap of anterior lobe was present; five were removed by operation, and in three a cap of anterior lobe was found. In one of those in which no anterior lobe was found the sella turcica was purposely not cleaned out completely at operation; from the other very little tissue was sent for histological examination. The constancy with which these tumours were enveloped in front by a demilune of anterior lobe, often of large size, suggests that the pars intermedia was the site of origin. If the tumours had arisen within the anterior lobe, it is

unlikely that they would all have occupied the same position. Additional evidence of origin in the pars intermedia was afforded by the absence of any normal remnant of that part of the gland and, in some tumours, by the occurrence of columnar cells or by the arrangement of the cells in long narrow processes.

2. *Tumour of Intercarotid Body.*

The specimen (S.D., 37, 1923) was received in formaldehyde solution on Jan. 5th, 1923. It was an oval mass of moderately firm consistence, and measured $2{\cdot}6 \times 1{\cdot}8 \times 1{\cdot}5$ cm. It was covered with a delicate membrane of white fibrous tissue, to which were attached many fibrous tags. The cut surface was yellowish-brown, and showed many pin-head and smaller rounded areas separated by narrow clefts. The mass was bisected along the long axis, and one half was embedded in paraffin.

Microscopic Examination.—The mass is composed of numerous, more or less round areas, in which a cellular centre is surrounded by a delicate fibrillar or, rarely, a dense fibrous tissue. Groups of these areas are separated by capillaries, or, more often, by wide capillary spaces. In the cellular centres of these areas the limits of individual cells can generally be distinguished. Such cells are usually spheroidal or polygonal. They measure in mean diameter from 6 to 13 μ, and their nuclei from 4 to 6·5 μ. The cytoplasm is homogeneous or very finely vacuolated. The nuclei have usually one diameter slightly longer than the other. They have a deeply stained, narrow membrane and a close network of delicate fibrils of chromatin, on which are many nodes; they contain one or two nucleoli. The nuclei of the smaller cells are more deeply stained. Sometimes the central cells are of spindle shape and greatly elongated, whilst their nuclei are of narrow, oval shape; in places the cells appear to be replaced by long cytoplasmic cords containing nuclei at intervals. The number of spindle cells does not appear sufficient to permit the majority of the spheroidal and polygonal forms being regarded as cross sections of spindles.

The fibrillar tissue in the periphery of the areas resembles glia closely. It contains a very few oval nuclei, round which cell bodies are seldom recognisable. The zone of fibrillar tissue is sometimes very narrow, and in a few spots is absent, so that the free central cells are separated from capillary spaces only by a layer of endothelial cells. Usually it is of considerable width. The differentiation between the central cells and the peripheral fibrillar tissue is often sharp, though processes from the cytoplasm of the most peripheral cells usually blend with the fibrils. On the other hand, very few of the central cells may be clearly differentiated, but almost the whole area may be occupied by cells intermingled and merged with glia-like fibrils. The denser fibrous tissue consists of collagenous fibres which are stained red by van Gieson's mixture. It contains long, narrow spindle cells, with narrow oval nuclei. It merges with the adjacent fibrillar tissue. This denser fibrous tissue is relatively rare. Definite nerve-fibres surrounded by a collagenous sheath are not recognisable.

The mass is surrounded by a capsule of dense fibrous tissue. But this capsule is not sharply differentiated: numerous chains of cells and fibrils pass into it, lying as a rule about vessels. These chains often consist of very long, narrow cells lying parallel to one another. Some of the chains appear to consist of parallel, multinucleate cytoplasmic fibres, but this structure cannot be recognised with certainty. The capsule contains also a few sharply defined bundles of nerve of normal appearance.

Summary and Interpretation.—The structure of the tumour resembles that of the normal intercarotid body closely, except that a glia-like tissue replaces the definite nerve-fibres of the normal structure. Owing to the omission of a suitable fixative it is, unfortunately, impossible to determine how many, if any, of the central, free cells are chromaffin cells. Their cytoplasm appears to be less liable to distortion by formaldehyde than that of chromaffin cells. Many of the cells are of elongated, spindle shape and resemble cells differentiating to form nerves. In places multinuclear cytoplasmic fibres appear to have been formed, though the presence of such fibres cannot be established definitely. Further, the glia-like tissue is similar to that seen in embryonic portions of tumours of nerve-fibres. The free spheroidal and polygonal cells may only represent the least differentiated stage of a tumour of nerve-fibres. The tumour is a neoplasm formed by neuroblasts. Many of these are certainly differentiating towards nerve-fibres; to what extent they are differentiating into chromaffin cells cannot be determined. These features indicate that the tumour is of the nature of a neoplasm. It is not a hyperplasia of chromaffin cells. It can be called a "mixed hypertrophy of the intercarotid body due to a simple neuroblastoma and embryonic neuroma."

(*Continued at foot of next column.*)

HÆMORRHAGIC DISEASE OF THE NEW-BORN.

WITH REPORTS OF SIX CASES.

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MEDICAL publications have recently contained frequent references to the so-called hæmorrhagic disease of the new-born; and there have been numerous records of cases in which the cure of the disease has been ascribed to the injection of whole blood. In this communication an attempt has been made to present the important points encountered in a review of the available recent literature; and six cases, all of which occurred in the Liverpool Maternity Hospital during the past year, are recorded.

The dominant symptom of this disease is hæmorrhage, either internal or external, which begins most often between the second and fifth days after birth, and rarely lasts more than five days. Examples of hæmophilia, and of symptomatic neonatal hæmorrhage, due to causes such as syphilis, sepsis, icterus, enteritis, asphyxia and birth-trauma, are not properly included in a discussion of this syndrome.

Important Clinical Features.

Reference need be made only to those clinical features which are most important. Bleeding may be external or internal; the former may take place from the nose, mouth, vagina, urethra, bowel, or umbilicus. Melæna with, or without, hæmatemesis is the most frequent form. The blood is usually quite fluid, but occasionally clots are seen. They were noted in two of my cases. Anæmia is rapid; approximately one may assume that the loss of 1 oz. of blood by an 8 lb. baby corresponds to the loss of 1 pint of blood by an adult. Pyrexia is frequently noted (Charts 1 and 2); it is transitory, and is probably nutritional in origin—a view to which the careful charts given in Welch's[15] paper lend support. Anorexia and drowsiness occur when bleeding is severe; in milder cases the child takes the breast normally. There is rapid loss in weight, with only slow return to normal when the child recovers. In suspected cases presenting unusual signs and symptoms the possibility of internal hæmorrhage must be remembered.

Some observers, including Holt,[7] believe that the illness is self-limited, and that the natural tendency and course of many cases is towards cure. But the value of appropriate treatment is evidenced by the fact that before the introduction of treatment by blood-injection the mortality rate was 50 per cent. to 60 per cent.; while recent reports suggest that the present death-rate is about 10 per cent. to 20 per cent.; in several short series of observations it has been under 10 per cent.

(*Continued from previous column.*)

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Ætiology and Pathology.

The ætiology and pathology of this disease present many difficulties, and it must be admitted that our knowledge is still very incomplete. Those who have looked for a gross pathological cause have pointed to the fact that on numerous occasions ulcers have been found in the gastro-intestinal canal, and especially in the first part of the duodenum. It is probable, however, that ulceration occurs in less than 50 per cent. of all examples of the hæmorrhagic disease; a majority of the cases show only hyperæmia, congestion, and punctiform hæmorrhages of the gastro-intestinal mucous membrane. Occasionally small superficial erosions are seen. It is said that round-cell proliferation occurs in the submucosa.

During recent years attention has been deflected from the gross pathology of the mother and child,

CHART 1.

Temperature chart of case of melæna neonatorum, born May 12th, 1923. Female, weighing 7 lb. 14 oz. at birth.
M = melæna began. S = 10 c.cm. horse serum intramuscularly. B = 10 c.cm. maternal blood, intramuscularly and subcutaneously.

and has been centred upon the complex subject of blood-coagulation in infancy; and it is now generally accepted that the fundamental cause of the hæmorrhagic disease of the new-born is to be found in a fault in the chemistry of the blood. My own observations are incomplete in this respect, for in my cases the blood was not specially studied. Rodda[13] has shown that in the normal infant there is a prolongation of the coagulation-time and bleeding-time from the first to the fifth days of life, and that after the fifth day there is a gradual return to the normal, which is reached on the tenth day. It may be that in the cases of hæmorrhagic disease there is an exaggeration of this normal feature; for Rodda (loc. cit.) noted that hæmorrhage occurred when an abnormally prolonged bleeding-time accompanied an abnormally prolonged coagulation-time. But Rodda (loc. cit.) and Lucas and his associates[11] noted that prolongation of coagulation-time, when accompanied by a bleeding-time of normal duration, may exist without the onset of hæmorrhage. It is probable, therefore, that at least two types of hæmorrhagic disease occur in neonatal life:—

(1) In this class there is a prolongation of coagulation-time, which may be due to excess of antithrombin, but is more probably ascribable, in accordance with the findings of Gelston[5] and Whipple[16] to deficiency of prothrombin. This deficiency is believed to be produced by a qualitative blood-platelet defect.

(2) In this class there is a prolongation of bleeding-time. In these cases a clot is formed, but it does not adhere to the edges of the breach in the vessel wall. Perhaps one might say with greater accuracy, that although clotting occurs in the main wound, thrombosis in the fine vessels adjacent to the wound is absent. Examples of this type have been variously ascribed to deficiency or defectiveness of prothrombin, of blood-platelets, and of thrombokinase.

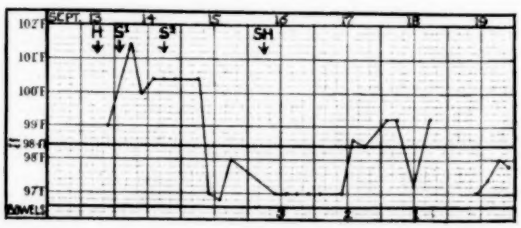
Influences of a more general nature have been regarded from time to time as possible causes of the hæmorrhagic disease; but it is unlikely that the age of the mother, her obstetrical history, the intra-uterine age of the child, the character of the labour, the sex of the infant, or the use of anæsthetics during labour have any bearing upon the condition under discussion.

Treatment.

The best treatment is to administer whole blood to the infant. No matter whether we consider the disease to be due to deficiency of prothrombin, or of platelets, or of fibrinogen, or of thrombokinase, whole blood will supply the deficiency. If we accept Howell's[8] theory of blood coagulation, and believe that the hæmorrhagic disease is caused by excess of antithrombin, it is probable that the injection of whole blood will neutralise this antibody. Furthermore, whole blood probably stimulates the neonatal tissues to produce the substance which was previously deficient or absent; and it certainly helps to make good the loss of fluid by hæmorrhage.

Unless the bleeding is very severe at its onset one is justified in giving whole blood by the subcutaneous or by the intramuscular route at first. The dose to

CHART 2.



Temperature chart of case of hæmatemesis neonatorum, born Sept. 11th, 1923. Male, weighing 7 lb. 14 oz. at birth.
H = hæmatemesis began. S^1 = 10 c.cm. horse serum subcutaneously. S^2 = ½ drachm orally. SH = slight hæmatemesis.

be administered will depend upon the findings at clinical examination; in a case of average severity it is probably wise to begin by injecting 20 c.cm. of blood (either citrated or not), obtained from the father, mother, or other donor by puncture of one of the antecubital veins. If hæmorrhage does not cease within two hours the injection should be repeated.

When the infant fails to improve speedily with this treatment, no time should be lost in resorting to intravenous transfusions, for, as Holt (loc. cit.) has emphasised, the fatal cases rarely survive more than three days, and often less than one.

Two important points must now be considered: First, whether blood-grouping is necessary; and, secondly, the choice of vein into which the injection is to be made. With regard to the former, there is evidence in the important papers of F. B. Chavasse,[2] W. M. Happ,[6] and B. B. Jones,[9] that the blood-group is frequently established in early infancy, and that the mother and her infant may belong to incompatible groups. These findings imply that transfusion without preliminary grouping is an unjustifiable procedure. Biasi,[1] however, has recently shown by "typing" the bloods of 100 mothers and their children, and by cross-testing the bloods of mother and child against each other, that in no case were the maternal corpuscles agglutinated by the serum of the infant. He found this to be true even when the bloods of mother and child belonged to incompatible groups. Cherry and Langrock[3] in the course of somewhat similar investigations had obtained results parallel with those of Biasi. These findings confirm the experience of most clinicians, including Falls[4] and Pearce,[12] that preliminary "typing" of the blood is unnecessary.

The second important point is the selection of a suitable vein into which the injection may be made. If there is a fairly large external jugular vein, the operation should not present much difficulty. This route has been used with success by Falls (loc. cit.), Lapage,[10] and others. The superior longitudinal sinus is favoured by some. The head of the infant must be held firmly by assistants, and the needle introduced as far posteriorly as possible in the

anterior fontanelle, to a depth of about three-eighths of an inch. It is a route which may be dangerous, but ill-effects are unlikely if the operator remembers that when the point of the needle is in the sinus the transfused blood should flow with the very slightest pressure on the syringe piston. Sidbury[14] recommends injection into the umbilical vein if the infant is not more than four days old.

In all cases the blood should be citrated (using 10 c.cm. of 3 per cent. sodium citrate solution to 100 c.cm. of blood), and should be injected at body temperature. The volume injected should depend upon the clinical condition of the infant. Cherry and Langrock (loc. cit.) state that 60 to 75 c.cm. of blood are approximately sufficient to supply the infant with the necessary substances to promote clotting and to replace the cellular elements lost by hæmorrhage. Others have used even larger doses; but it is probable that the coagulation defect in the child can be remedied by much smaller injections. Horse serum and human serum have been used, and have frequently proved efficacious; but they must be fresh, because thrombin is fairly rapidly transformed to inert metathrombin. It is obvious that serum treatment cannot supply fibrinogen; it will be useless in cases due to deficiency of this substance.

It is unnecessary to emphasise the importance of employing any surgical treatment which may be indicated for the control of hæmorrhage, for instance, from a bleeding umbilical vessel. Shock caused by severe blood loss may require intravenous or subcutaneous injections of normal saline solution. Rectal injections of 5 per cent. glucose solution have also been used for this purpose.

Case Notes.

The brief notes of my own cases are as follows:—

CASE 1.—Mother aged 28. One previous pregnancy, ending in miscarriage. Duration of present pregnancy: 39½ weeks. Induction of labour on account of disproportion. Normal vertex delivery in the right occipito-anterior position. Duration of labour: 13¾ hours.

Infant: Female. Weight: 7 lb. 14 oz. Onset of melæna 26¼ hours after birth. Severe hæmorrhage, with pallor, yawning, and dry mouth. Weight fell to 7 lb. 5 oz. on the fifth day; increase began on the eighth day. Uneventful recovery. (See Chart 1.)

Treatment.—(1) Horse serum, 10 c.cm., intramuscularly; (2) maternal blood (citrated), 10 c.cm., intramuscularly and subcutaneously. An attempt to inject maternal blood into the superior longitudinal sinus was unsuccessful.

After-history.—The infant is now 7 months old. Weight: 18 lb. She is still pale, but otherwise normal.

CASE 2.—Mother aged 22. One previous pregnancy, ending in miscarriage. Duration of present pregnancy: 36 weeks. The mother suffered with albuminuria, œdema, and headaches during the pregnancy. Labour: normal vertex delivery in the left occipito-anterior position. Slight post-partum hæmorrhage. Duration of labour: 33 hours.

Infant: Premature female child. Weight: 4 lb. 7 oz. Onset of umbilical hæmorrhage 120 hours after birth. Copious bleeding; pallor; yawning. Spasmodic spurting of blood from an umbilical artery. Formation of clots was noted. Umbilical cord separated on the eighth day. By the ninth day the weight had fallen to 3 lb. 14 oz., but the infant recovered in spite of an attack of enteritis.

Treatment.—(1) Cord-stump ligatured with catgut: adrenalin solution (1/1000), and tannic acid applied to umbilicus, which was covered with a well-secured pad; (2) maternal blood (oxalated), 2 c.cm., injected into superior longitudinal sinus; (3) maternal blood (oxalated), 18 c.cm., intramuscularly in two separate injections of 10 c.cm. and 8 c.cm. respectively.

After-history.—The infant is now 15 weeks old, and weighs 8 lb. 5 oz. She has a slight umbilical hernia, and is pale. Her general health is fairly satisfactory, but she is obviously of poor physique.

CASE 3.—Mother, aged 37, had had three previous normal labours. Duration of present pregnancy: 40 weeks. Induction of labour on account of disproportion. Normal vertex delivery in the left occipito-anterior position. Duration of labour: 2½ hours. The mother was removed to an asylum suffering with puerperal insanity.

Infant: Male. Weight: 7 lb. 14 oz. Onset of melæna and hæmatemesis 43 hours after birth. Severe hæmorrhage of short duration. Weight fell to 6 lb. 5 oz. on the eighth day. Uneventful recovery. (See Chart 2.)

Treatment.—(1) Horse serum, 10 c.cm., intramuscularly; (2) horse serum, ½ drachm, orally; (3) calcium lactate, 3 gr., every four hours for three days.

After-history.—The infant is now 13 weeks old and weighs 13 lb. Apart from slight pallor, the child is healthy.

CASE 4.—Mother aged 34. No previous pregnancies. Duration of present pregnancy: 40 weeks. Normal vertex delivery in the left occipito-anterior position. Duration of labour: 9 hours.

Infant: Female. Weight: 6 lb. 5 oz. Onset of hæmatemesis and melæna 24 hours after birth. Severe bleeding, with pallor and dryness of the mouth. Weight fell to 5 lb. 5 oz. on the fifth day; afterwards, steady gain. Uneventful recovery.

Treatment.—(1) Horse serum, 10 c.cm., intramuscularly in two separate injections of 5 c.cm. each; (2) maternal blood (citrated), 30 c.cm., intramuscularly in three separate injections of 10 c.cm. each; (3) liquor adrenalini (1/1000), 1 minim, orally every two hours for 48 hours.

After-history.—The child is now 2 months old. Weight: 8 lb. 13 oz. She is still pale, but is otherwise normal.

CASES 5 and 6.—Mother aged 38. Five previous normal labours. Duration of present pregnancy: 37½ weeks. Albuminuria, vomiting, and œdema, probably due to chronic renal disease, occurred during the pregnancy. Labour: twin infants; both presented by the breech, and were delivered in the left sacro-anterior position. Duration of labour: 4½ hours.

Infants.—CASE 5.—Premature female child. Weight: 5 lb. 4 oz. Onset of hæmatemesis and melæna 49¾ hours after birth. Bleeding of moderate degree. The infant became extremely feeble, and on the sixth day of life the respirations became laboured and rapid, and the child collapsed. The temperature rose to 100° F., and on the morning of the seventh day it was 101·8°. Though extremely emaciated and weak, the child gradually recovered. On the eighth day the weight was only 4 lb. 2 oz. The infant was too feeble to suck; breast-milk was expressed and given in a spoon. Sherry-whey was also used.

Treatment.—(1) Paternal blood (citrated), 46 c.cm., intramuscularly, in five separate injections of 4 c.cm., 12 c.cm., 10 c.cm., 10 c.cm., and 10 c.cm. respectively; (2) horse serum, 4 c.cm., intramuscularly; (3) maternal blood (citrated), 1½ c.cm., intravenously (superior longitudinal sinus), 8½ c.cm. intramuscularly; (4) liquor adrenalini (1/1000), 1 minim, two-hourly for 48 hours.

After-history.—The infant is now 6 weeks old. She is pale and feeble, and weighs only 5 lb. 14 oz. Progress fairly satisfactory.

CASE 6.—Premature female child. Weight: 5 lb. 2 oz. Onset of hæmatemesis and melæna 43¼ hours after birth. Very severe hæmorrhage, with collapse. The infant died 23 hours after the bleeding began. Mr. J. St. G. Wilson kindly performed the autopsy. He found small superficial erosions of the gastric mucous membrane; there were no definite ulcers in the gastro-intestinal tract. No spirochætes were found in sections of the liver, lungs, spleen, suprarenals, and kidneys.

Treatment.—(1) Horse serum, 5 c.cm., intramuscularly; (2) paternal blood (citrated), 30 c.cm., intramuscularly in three separate injections of 10 c.cm. each; (3) subcutaneous saline injections; total volume, 70 c.cm.

Comments.

There were no cases of hæmophilia in my short series. With one exception, the infants were females, and the family histories did not reveal any "bleeders." In no case was there any reason to believe that hæmorrhage was secondary to some gross underlying cause, for instance, syphilis or sepsis. The average age when hæmorrhage began was 51 hours. In Case 2 the maternal blood was prevented from clotting by the addition of the minimal amount of potassium oxalate necessary for this purpose. Although the quantity of oxalate employed was too small to cause any toxic effects, accidents might happen with this procedure. On the other hand, the citrate method is quite safe, and is equally efficacious. In Case 3 a small dose of horse serum and calcium lactate were both given orally; it is very doubtful, however, whether either of these treatments possess any value.

I wish to express my thanks to Miss M. H. F. Ivens and to Dr. J. H. Willett, honorary surgeons to the Liverpool Maternity Hospital, for permission to publish these cases.

(*Continued at foot of next page.*)

VITAMIN-A DEFICIENCY IN DENMARK AND ITS RESULTS.*

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HAVE we any reason to fear that our food is too poor in vitamins? Can one observe a deleterious influence on the health of the people which one could ascribe to under-feeding with vitamins? These are practical problems of the greatest importance which have emerged from the recent investigations on the physiology of nutrition.

In those countries where beri-beri and scurvy are common diseases the deficiency in vitamins and its effects are obvious. In those countries, however, we are dealing with a population which, as a rule, lives on such an extremely monotonous diet that the cause of the vitamin deficiency can be demonstrated without difficulty. It is more difficult to determine to what extent a deficiency in vitamins may affect the health of the community in those countries where the diet is more varied. The question has arisen whether such a deficiency may occur under normal conditions in the civilised nations of Europe and America.

This question has been repeatedly discussed during the last few years. Some writers have certainly exaggerated the importance of the possible vitamin deficiency to which they have attributed as an immediate cause a whole series of the most various diseases and conditions of debility. The opposite extreme has been the complete neglect of considering the possibility of a vitamin deficiency. It has been asserted that if only the diet is sufficiently varied and contains the necessary number of calories the supply of vitamin regulates itself.

On the whole, the discussion has not reached any definite result on account of the absence of definite facts. We do not know enough about the actual demand in vitamins by the human organism. Moreover, our knowledge of the amounts of the different vitamins in our articles of food is not sufficiently exact to establish a calculation of the proportion between vitamin requirements and vitamin supply. For the present one is therefore compelled to deduce the occurrence of vitamin deficiency from the occurrence of such diseases which can be caused by vitamin deficiency.

Xerophthalmia and its Cause.

The observation of the Danish ophthalmologist, Olaf Blegvad,[1] on the occurrence of this eye affection in Denmark has given us very important information on the vitamin economy in that country.

Xerophthalmia is an eye disease which occurs particularly in the children of about a year or less; occasionally it occurs also in adults. The disease is preceded as a rule by loss of weight of the child. The disease is essentially a general disturbance of nutrition; the eye affection is only a partial symptom which occurs rather late in the development of the disease. The cornea has a dried appearance, the conjunctiva and eyelids swell and are inflamed; in the later stages of the disease the cornea shows definite lesions which break through the latter and then the whole eyeball is filled with pus. If the disease runs through all these stages complete blindness is the result. In adults the disease is arrested as a rule in an early stage, which is characterised by a slight inflammation and dryness of the cornea. This early stage is also associated with a peculiar alteration in the power of vision of the patient—hemeralopia or night-blindness. The vision of the patient is normal during the day, but as soon as dusk begins his vision suddenly is very bad and only becomes normal again with daylight.

The symptoms which we have described are associated with a whole series of complications. A very characteristic feature is the slight resistance of the patient against infections of different kinds. For 165 cases collected by Blegvad, the following complications are recorded: Pneumonia, 63; bronchitis, 45; pyuria, 42; otitis media, 30; nasal catarrh, 26; subcutaneous abscesses, 4.

Xerophthalmia, or "dystrophia xerophthalmica," as the whole symptom-complex was called by Blegvad, is on the whole a relatively rare disease. During the 12 years 1909–1920 Blegvad has collected in the whole of Denmark 434 severe and 148 light cases. The disease is more common in Denmark than in any other country from which statistical data can be obtained. Only in Japan has the disease reached the same frequency as in Denmark; in Sweden it practically does not occur at all.

During the last decennium xerophthalmia in Denmark increased in frequency. In fact, it has become there one of the main causes of blindness in children. Formerly, venereal infection was the common cause. This has now been replaced by xerophthalmia. Now the same disease can be produced in animals experimentally, if one excludes the fat-soluble vitamin A from the food. Between the xerophthalmia of children and that of the experimental animals no difference can be established either clinically or anatomically, and the investigations of Blegvad prove conclusively that the xerophthalmia in man is caused by a deficiency in vitamin A. He shows that the food in the overwhelming number of cases of the disease in children was poor in vitamin A; that in those cases where the vitamin deficiency in the food could not be demonstrated, other conditions were present which would cause a deficient absorption of vitamin A by the organism; that the variations in the number of cases run parallel with the corresponding variation in the supply of vitamin A which was available for consumption to the people as a whole; and lastly, that the poorer the food was in vitamin A, the shorter was the period during which a child could live on that food before the disease set in.

Xerophthalmia is not the only Effect of the Deficiency in Vitamin A.

Everybody who has experimented with the effect of food poor in vitamin A or free from any vitamin A on rats must have observed that the general condition of the animals suffers long before the eye disease appears. In young animals the growth stops almost always, their fur gets rough, they easily show infections of various kinds. If the vitamin deficiency is not complete no eye disease appears at all, and only the general condition of the animal suffers. Adult females breed badly; if they become pregnant they show a great loss of weight, and often eat several or all of the new litter. They are not able to nourish

* A paper read before the Physiological Society at Lund, Sweden.

[1] Om xerophthalmien og dens forekomst i Danmark i aarene 1901–1920, Dissertation, Copenhagen, 1923, Danish.

(*Continued from previous page.*)

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adequately their young, and the mortality among the latter is great.

As the result of the experience gained from these experiments on animals, it follows necessarily that there must be in a population in which xerophthalmia occurs a much larger number of cases in which the deficiency in vitamin A, without producing the eye disease, is the cause of a diminished resistance against infections, of general debility, and of malnutrition.

We shall see from the following that this expectation is fulfilled, and it is for this reason that we must ascribe to this relatively rare disease such an eminent importance. The cases of xerophthalmia are recorded and treated in hospitals where an abundant supply of vitamin A in the form of cod-liver oil and full milk as a rule produce a cure. These cases are the most obvious indication of the vitamin deficiency, but apart from these cases there are probably a whole army of patients whose diseases get other names: disturbances of nutrition, pneumonia, bronchitis, rachitis, and so on, and for whom it was really the deficient intake in vitamin A which was the cause of their succumbing to the diseases. The investigations of Blegvad have given us the first certain proof of the occurrence of an under-feeding in vitamin A on a very large scale. It is a proof which cannot be denied even by those who believe only in the power of the calories and doubt the importance of the vitamins for the health of the people.

The Cause for the Occurrence of Xerophthalmia in Denmark must be looked for in an Excessive Export of Butter.

One is naturally inclined to ask why the vitamin-A deficiency has shown itself more distinctly than in any other country, not affected by the war, in Denmark, which to us in Sweden, at any rate, has always appeared as a country "flowing with milk and honey." No country in the world has proportionately to its population such a highly developed dairy industry as Denmark. This has become the main industry of the country, and it is on it that the wealth of the country mainly depends. The dairy products butter, cream, and partly also cheese, are the foodstuffs richest in vitamin A, and when they are exported Denmark also exports its vitamin A. This has occurred to such an extent that the whole population of the country has suffered. This important relationship has not been considered in great detail by Blegvad in the paper referred to above. I should like, therefore, to throw more light on the significance of this export on the occurrence of xerophthalmia in Denmark on the basis of a few statistical data.

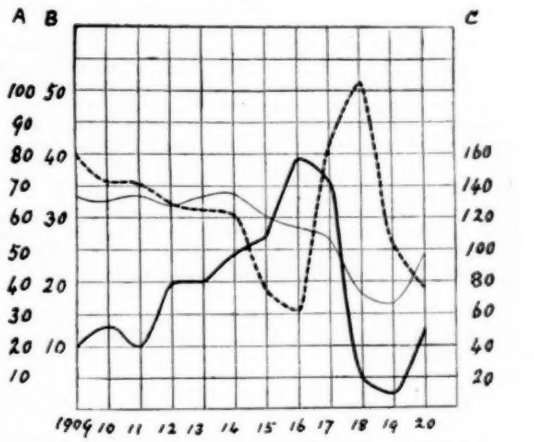
TABLE I.—*Relation Between the Milk Fat Consumption in Denmark and the Frequency of Xerophthalmia.*

Year.	Milk fat produced and imported.	Milk fat exported.	Milk fat consumption in the country.		Number of cases of xerophthalmia.
			Total mill. kg.	Per day and person.	
	Mill. kg.	Mill. kg.		g.	
1909	132·9	93·4	39·5	40·0	20
1910	130·1	94·6	35·5	35·6	26
1911	133·0	97·3	35·7	35·3	20
1912	128·7	95·6	33·1	32·3	40
1913	133·8	101·4	32·4	31·2	40
1914	133·2	101·3	31·9	30·4	48
1915	121·5	102·3	19·2	18·1	53
1916	113·8	97·4	16·4	15·3	78
1917	106·7	62·1	44·6	41·0	71
1918	71·9	15·2	56·7	51·5	9
1919	66·4	37·6	28·8	26·2	4
1920	98·8	77·4	21·4	18·9	25

In Table I. I have calculated from the number of cows and the average yield of milk the production in Denmark of milk fat, expressed in million kilogrammes of butter per annum. It has been assumed in this calculation that 26 kg. of milk yield 1 kg. of butter. For the years 1909–14 these figures have to be supplemented by the amount of milk imported into Denmark. After 1914 this import can be neglected in the calculation, since after that date it was practically stopped. These figures are given in the second column. In the third column is the export of milk fat from Denmark expressed in the same way. The export of cheese is here not calculated, as it is at present difficult to compare the vitamin content of cheese with that of butter. The figures for the export are therefore certainly too low.

In the fourth column of Table I. is given the difference between the figures of the two preceding columns—that is to say, the amount of milk fat consumed by the people in the country. In the second half of this column these figures have been calculated for the daily consumption per individual in grammes. The last column contains the cases of xerophthalmia as collected by Blegvad. The table is illustrated by Fig. 1. The thick line gives the cases of xeroph-

FIG. 1.



– – – – – Consumption of milk in grammes per day (Col. B).
▬▬▬ Cases of xerophthalmia (Col. A).
——— Production and import of milk fat in million kg. (Col. C).

thalmia, the thin line the production in milk fat, and the broken line the consumption per individual.

It shows at once that the consumption of milk fat before the war and until 1916 inclusive has steadily declined so as to reach very low values in that last year. At the same time, the number of cases of xerophthalmia reached their maximum in that year—1916. Then there was a complete change. In the end of 1917, during 1918, and partly also during 1919 the export of butter was forbidden. In spite of the fact that the production of butter during that time decreased, much more milk fat was consumed in the country than in the years before the war. Xerophthalmia disappeared almostly completely, but reappeared in 1920 when the export of butter began again.

During the whole period Denmark has, therefore, suffered from its export of vitamin A, except during certain years of the war when the consumption reached 40–50 g. of milk fat per day and person.

The Vitamin Store in Sweden.

Since xerophthalmia is practically unknown in Sweden one must conclude, if the preceding deductions are correct, that the consumption in milk fat in Sweden is greater than in Denmark. This seems indeed to be the case. Statistical figures which have been collected for the consumption in articles of food in the poorer households during the years of the war 1914–18, show that the daily consumption during 1914 was on an average 52 g. of milk fat per member of the family, and during 1917, 53 g. The correspond-

ing figures for Denmark are 30·4 g. and 41·0 g. per person. It must also be taken into consideration that the figures for Sweden refer only to the poorer families, while the figures for Denmark represent the average values for the whole population. In reality the difference is, therefore, much greater.

Two Additional Causes of the Vitamin Deficiency: Consumption in Margarine, and the Feeding of Cattle.

It is clear, therefore, that the export of butter from Denmark is really the immediate cause of the vitamin deficiency. The population naturally looks for a substitute for the butter; this substitute is margarine.

Dr. Blegvad makes here the following comments. Formerly all adult people in Denmark consumed rather large quantities of butter. During the last few years, however, butter has been replaced by the cheaper substitute—margarine, which is used especially by the economically less well situated population. At the beginning margarine was prepared from animal fat, which contains small amounts of vitamin A, but during the last years the animal margarine has been replaced more and more by vegetable margarine, since the latter can be manufactured more cheaply and tastes better than the animal margarine. The vegetable margarine contains only slight traces of vitamin. Even when margarine is mixed with a little milk, the content in vitamin A, as Halliburton and Drummond, and Drummond have shown, is quite inadequate.

Table II. and Fig. 2 show that the import of the raw materials for the vegetable margarine industry has increased enormously from 1909–16. During 1917–18 the import was insignificant, but

TABLE II.—*Proportion Between the Frequency of Xerophthalmia and the Import of Oil Cakes and Vegetable Fat.*

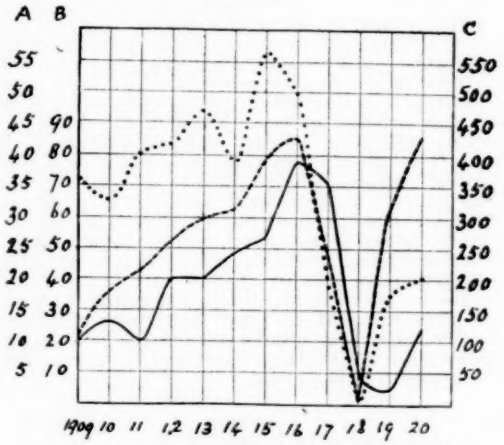
Year.	Oil cakes per cow.	Vegetable fat. Total imports.	Number of cases of xerophthalmia.	Year.	Oil cakes per cow.	Vegetable fat. Total imports.	Number of cases of xerophthalmia.
	kg.	mill. kg.			kg.	mill. kg.	
1909	367	10·4	20	1915	564	39·0	53
1910	329	17·4	26	1916	499	42·8	78
1911	403	20·8	20	1917	159	23·4	71
1912	419	25·7	40	1918	5	0·3	9
1913	479	29·7	40	1919	177	31·3	4
1914	391	30·7	48	1920	203	43·3	25

increased again considerably during 1919 and 1920. If we compare the importation of vegetable fat with the consumption of milk fat, we find that the vitamin-containing milk fat is being replaced from year to year in increasing amounts by the vitamin-free vegetable fat, and this goes on progressively. Only the two years of the war—1917–18—make an exception, where the conditions were reversed and there also the obvious indication of the vitamin deficiency—the xerophthalmia—disappeared.

It must be taken into consideration that the vitamin content of the milk fat can vary too, and can thus influence the onset of xerophthalmia. Agriculture in Denmark is carried out according to modern principles. Stall-feeding or winter feeding has changed completely during the last few years. Formerly, the stall-feeding for cows consisted almost exclusively of hay and straw, while now one has gone over to turnips and oil cakes, which together with straw constitute the stall-feeding of cows. One knows that this feed is very poor in vitamin A, and one has been able to show that the vitamin-A content of butter and milk is considerably diminished as the result of this feeding. The table shows that the frequency of the xerophthalmia also follows the importation of oil cake. The extent of this importation is given in the second column of Table II.

This might possibly account for the fact that most of the cases of xerophthalmia occur during the months of January to May, while they are practically absent during June to December. During the first period the children receive milk fat which has been formed during the stall-feeding. During the second period green food constitutes a larger or smaller portion of

FIG. 2.



– – – – – Import of vegetable fat in million kg. (Col. A).
——— Cases of xerophthalmia (Col. B).
..... Oil cakes in kg. per cow and year (Col. C).

the food of the cows. Blegvad has been able to show that in those years where the grass feeding begins soon the cases of xerophthalmia also disappear sooner in the summer.

Xerophthalmia is Not the Only Result of Vitamin Deficiency in Denmark.

So far we have only dealt with the vitamin deficiency as it can be measured and studied clinically in man, taking as a criterion xerophthalmia. The results of animal experiments compel us to draw even more serious consequences. I have already mentioned that a diminution in the vitamin-A content of the food of the animals leads to xerophthalmia only in the most extreme cases. There is, in addition, the general effect: the diminished resistance against diseases, and the diminished vitality of the progeny.

Can a similar effect be demonstrated in Denmark?

The table of the consumption of milk fat shows that it was smallest during the years 1915 and 1916, and was greatest during the years 1917 and 1918, and partly also during 1919. We have, therefore, here an involuntary experiment on the importance of vitamins in which the whole population of Denmark was the test object. The harmful effects of the vitamin deficiency may be expected to manifest themselves by an increase in certain diseases during the years 1915–16, and as a late effect during 1917. Conversely, the increased consumption of vitamin A during 1917–18 and during the first half of 1919 should manifest its favourable effect by a diminution in the frequency of these diseases during 1918 and 1919.

In Table III. I have reproduced a preliminary extract from the statistical data on the causes of deaths in the town population of Denmark. I have there collected a number of diseases which are probably influenced by the deficiency in vitamin A. If we leave out the first three years we find that the infant mortality during the first year of life shows a great increase in the year 1916. It sinks in 1918 and reaches in 1919 the lowest value of the period. 1920 again shows a considerable increase. The year 1916 also shows the greatest mortality for children aged 1–5.

The vitality of the children is reflected in the number of cases in the column "Congenital debility." We see how the number of deaths from this cause gradually increases from 1914 to 1917 where the maximum for the period is reached; 1918 and 1919 show a diminution; 1920 again a considerable increase.

TABLE III.

Year.	Milk fat consumption in grammes per day and person.	Cases of death from—			
		All causes under 1 year of age.	Congenital debility.	Rickets.	Tuberculosis of the lungs.
1909	40·0	3136	696	32	1228
1910	35·6	3456	647	27	1190
1911	35·3	3191	653	34	1274
1912	32·3	2771	605	18	1331
1913	31·2	2830	673	20	1208
1914	30·4	2986	630	39	1267
1915	18·1	2625	694	27	1234
1916	15·3	3136	747	45	1492
1917	41·0	2835	771	24	1689
1918	51·5	2348	649	19	1307
1919	26·2	2549	608	23	1197
1920	18·9	3006	744	15	1204

It is well known that rickets is rarely a cause of death; rachitic children die, as a rule, from affections of the lung, and therefore these cases are usually entered in the column for lung diseases. The column for the mortality from rickets shows, however, that this reached its maximum in 1916. For adults, too, 1916 was a bad year. The mortality from tuberculosis of the lung showed for the town population during the years 1916 and 1917 a very considerable increase. Compared with 1914, the year 1917 shows an increase of over 30 per cent. After 1918 the mortality falls.

How to Deal with the Vitamin Deficiency.

It is clear that the conditions with which we have dealt represent a conflict between the economic and hygienic interests in Denmark. This has been revealed by the excellent work of Dr. Blegvad, and it is a problem which is not easy of solution. On the one hand, the great export of butter is bad for the health of the people; on the other, the economic well-being of the people depends on it. But vitamins and money go together. The well-to-do family can, by varying its food, provide itself with the necessary vitamins. They eat butter and drink milk: the less well-to-do people must be satisfied with substitutes poor in vitamins. Xerophthalmia occurs mainly amongst the poorer people. In view of this fact one can hardly expect that a diminution in the export of butter would be the solution. Perhaps the solution will have to be sought in making the cheaper substitutes for butter sufficiently rich in vitamins, but here, too, one meets with economic questions of considerable difficulty. The vitamin for the substitute must be cheaper than the vitamin of the milk fat if such a proceeding is to have any value. For the present, at any rate, the vitamin A of cod-liver oil is the cheapest. The amount of vitamin present in 350 tons (=350,000 kg.) of cod-liver oil when consumed annually would certainly suffice to protect the whole population of Denmark against the dangers of a vitamin deficiency, and an importation of 600 tons would completely cover the vitamin export of the country.

How minute the amounts of the actual vitamin required are can be shown by the following calculation. The Norwegian pharmacologist, Poulsen, has prepared from cod-liver oil a substance which, when given daily in amounts of 0·004 mg. enables young rats to grow. An addition of 8 mg. per kilo. would be sufficient in order to give to margarine the vitamin content of butter, and a few bags of about 1200 kg. would be sufficient to contain the whole amount of vitamin exported from Denmark during one year. And still this preparation is by no means pure: perhaps its vitamin content is only a few per cent.

Clinical and Laboratory Notes.

TWO CASES OF SEMINAL VESICULITIS TREATED BY OPERATION.

BY HAROLD C. EDWARDS, M.B.LOND.,
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THE following are two recent cases of chronic seminal vesiculitis arising from infection of the urinary tract, and treated radically by a transvesical operation.

CASE 1.—The patient was a man aged 52 with a history of stricture. The first observation of urinary infection was made four years ago, when the patient had an attack of "influenza," and pus was discovered in the urine. The pyuria continued and the urine became thick at intervals. There was no disturbances of micturition. Last September the patient suffered an injury to the scrotum by falling across an iron fence. Dating from this time a swelling appeared in the left side of the scrotum which became larger and eventually burst, yielding a large quantity of pus.

Condition on Admission.—The patient was admitted to hospital on Nov. 24th, 1923. He had a discharging scrotal sinus. The prostate was normal in size and consistence. A large œdematous inflammatory mass occupied the position of the left seminal vesicle. The right vesicle was felt as a soft cushion. The patient suffered from periodic attacks of pyrexia, lasting usually 48 hours, with headache and profuse perspiration. The so-called "influenza" was probably an attack of this kind. The sinus in the scrotum was opened up and packed with iodoform gauze. A large quantity of pus was evacuated and the wound allowed to heal by granulation. Coliform organisms in pure culture were discovered in the pus.

The patient was discharged and readmitted on Jan. 22nd, 1924, when the radical operation described below was performed.

CASE 2.—The patient, aged 57, a very nervous type, had gonorrhœa 28 years ago, and had since had some difficulty in passing water. Two years ago he commenced to have periodical attacks of nocturnal incontinence, recurring at intervals of three weeks. On Feb. 22nd last year he had an attack of acute retention with strangury. The urine was thick. The acute condition subsided, but retention persisted, and the patient had to be catheterised twice daily. A few weeks later a suprapubic operation, in which a portion of the prostate was removed, was performed at another hospital. This partially relieved the obstruction but was insufficient, for the suprapubic wound did not close. It healed and broke down alternately for a period of nine months. The patient could not tolerate having a catheter tied in.

Condition on Admission.—The patient was admitted to hospital on Feb. 23rd, 1924. He had difficulty in micturition and a small stream. He passed water half-hourly in the daytime, but was incontinent while sleeping. The urea concentration was slightly subnormal (1·4 per cent.) and the blood-urea 37 mg. per 100 c.cm., without a urea meal—i.e., just within normal limits. The right lobe of the prostate was swollen and tender, and the right seminal vesicle formed a large film cylinder with a rough, uneven surface. The left lobe of the prostate was moderate in size, and the left seminal vesicle was not felt. The skin around the scar of the previous operation was red, œdematous, and tender, and urine leaked from a small sinus in the centre.

A New Technique.

In both cases the following transvesical radical operation was performed by Sir John Thomson-Walker. The technique of the operation varied only in detail.

The patient was catheterised and the bladder distended with normal saline. A mid-line subumbilical incision was made, and the bladder exposed and incised. The incision was extended and a bladder retractor put in position. An incision was made through the trigone and bladder base, extending from the posterior lip of the internal meatus to one and a half inches beyond the base of the trigone. This incision was continued round the internal meatus about a quarter of an inch from the orifice.

In Case 1 the seminal vesicles and the prostate were hard, indurated, and densely adherent. The vesicles and corresponding halves of the prostate were in turn dissected out with long rat-toothed forceps and curved scissors. A drainage-tube was stitched in the cavity left by removal of the vesicles and carried across the bladder to the suprapubic

wound. A large drainage-tube was placed in the bladder, the anterior vesical wall closed by continuous suture, and the wound on the abdominal wall repaired. A catheter was tied in the urethra. The post-vesical drain was removed on the eighth day and the vesical tube on the ninth, together with the catheter. When the suprapubic wound was nearly healed a catheter was again tied in, and before removing the catheter it was plugged for an increasing period with a spigot. The patient was discharged from hospital on Feb. 26th, 35 days after the operation. The suprapubic wound was healed and normal micturition established. There was no residual urine. Pathological examination showed extensive inflammatory changes. No organism was cultivated from the vesicles.

In Case 2 the right vesicle was distended with pus. It was removed together with the prostate. The base of the bladder was closed by continuous catgut suture, and the postvesical area was not drained. Prevesical and vesical drains were inserted and the abdominal wound closed. A catheter was left in the urethra. The prevesical drain was removed on the fifth day and the vesical on the sixth, together with the catheter. A catheter was tied in while the suprapubic wound closed, and the bladder gradually distended. When the catheter was removed the patient passed water without difficulty. A No. 16 Lister's bougie was passed with ease. The patient was discharged 30 days after the operation. Pathological examination showed great increase of fibrous tissue and round-celled infiltration. The predominant organism cultivated from the pus was a coliform bacillus devoid of fermentative activity.

Comments on the Cases.

The common feature in these two cases was the presence of *B. coli* in pure culture as a cause of seminal vesiculitis. In the first case, the course was an abscess tracking to the surface and recurrent pyrexia from toxæmia, and, at the same time, symptoms of chronic cystitis. In the second case the symptoms were those of obstruction which had been mistaken for enlargement of the prostate. The transvesical method used by Sir John Thomson-Walker has the advantages over the perineal route that the approach is more direct; a full exposure is possible; there is no damage to the external sphincter (the compressor urethræ muscle) and therefore no danger of incontinence; there is no danger of urinary fistula, and none of damage to the rectum.

ON THE USE OF NON-INFLAMMABLE CELLULOSE SPLINTS WITHOUT PRELIMINARY PLASTER CASTS.

BY Z. P. FERNANDEZ, CH.B., M.D. LEEDS,

MEDICAL OFFICER, ARMLEY SANATORIUM, AND DEPUTY TUBERCULOSIS OFFICER, LEEDS.

THE decreasing mortality and crippling from bone and joint tuberculosis in children since the advent of conservative treatment with earlier diagnosis form a bright landmark in the oft-criticised tuberculosis campaign. In the case of adults there are many centres that still resort to the short cut by the knife, but the post-operative results in many of these cases are very disappointing, with return to work indefinitely put off.

I have published in THE LANCET [1] my experience of the fatal results of operated spinal cases admitted to our sanatorium. On the other hand, in spite of the adverse conditions of Leeds, our experience in following up adults treated on conservative lines with dispensary or domiciliary supervision has been very encouraging.

Rest is the key-note of the conservative method and splinting a natural corollary during the subacute or ambulatory period. Rollier condemns plaster splints for permanent use, but he freely employs celluloid splints in the ambulatory stage and in certain acute conditions. The disadvantages of plaster of Paris are well known. The preliminary plaster casts that are necessary in making celluloid splints and the time involved in drying led me to investigate a more easily applied substitute.

[1] THE LANCET, 1919, ii., 1193.

The use of cellulose acetate was suggested to me by the employment of cellulose dope or varnish for stiffening and weather-proofing aeroplane fabrics. I believe the dope has been used in artificial limb manufacture, but, as far as I am aware, not for splints. The cellulose acetate we use is quite different from celluloid, and is non-inflammable. We employ two solutions: Solution 26, which is thicker and more viscous, being used for the inner and outer coatings; and the thinner, solution 25, for the middle or additional coating. The finished splint has a glazed appearance, does not absorb moisture, and therefore well withstands perspiration.

Technique.

The part to be splinted is tightly covered with oil-silk or jaconette to prevent oozing and adhering of solution to the body. The different pieces may be stitched up and covered by an ordinarily worn under-garment, which may be made body-tight by a few stitches. Two or three Gigli's saw wires, 6 or 9 in. long, are then fixed by a coat of ordinary bandage in a straight line in a convenient anterior aspect. The ends of the saw wire must be left uncovered and loosely fixed to facilitate sawing out. About a pint or two of solution of cellulose acetate,[2] kept in a covered tin to prevent evaporation, and a good painting brush, 1½ in. wide, and ordinary bandages are got ready. It is advisable to work with gloved hands. For spine and lung splints a suspending posture is avoided by using the head and chin fixer made for me by Messrs. Reynolds and Branson. This permits lateral or vertical adjustment. If a standing posture is not possible the bandages are cut in pieces, and fixed by the cellulose solution. When dry, the patient is turned over, and the process completed. After a coat of the thicker solution is painted on to the layer of bandage fastening the saw (but avoiding the saw), two more layers of bandage followed by the cellulose thinner solution are put on. For the next three or four layers, crinoline or stiff material, such as used overalls, with a thick coat of cellulose will be sufficient. The splint may then be sawn out by an easy to-and-fro movement of the Gigli saw, having previously marked with ink the adjoining aspects of the splint to identify. The splint is removed from the body with the under-garment and oil-silk cut off by scissors. The two cut ends of the splint are stitched up at a few inches intervals, and three or four layers of bandage with three or four coatings of cellulose put on, ending with two final coats of thicker solution to give a glazed appearance. As a rule, the splint put on in the morning is ready to be cut out by the afternoon. For aeration the splint is perforated by a screw-driver. If expense is no concern, the edges may be leathered and hooks put on; otherwise braiding with thin pieces of bandage of the edges will answer the purpose, and strappings with buckles stitched on to fix the edges. A film preparation of cellulose acetate, known as "celastoid," will be found very convenient for the inner coat. This, cut in 4" × 1' size and warmed in tepid water, is easily moulded to the body-garment with the oil-silk and wire intervening. (Celastoid, with its high insulating property, could be of value in radiological work.) The next layers are completed with cellulose acetate on bandages. Though a little more expensive, celastoid gives a skin-like smoothness to the inner surface of the splint. The whole splint is made in a day at a very cheap cost, and is light, rigid, and pliable for adjustment.

These splints are of value in fractures and paralytic conditions, as they are conveniently put on without disturbing the patient. I hope that the technique I have followed will be of assistance to tuberculosis officers and to those interested in orthopædic work.

PS.—I have read with interest the paper in the last issue of THE LANCET on Surgical Tuberculosis in Egypt by Prof. R. V. Dolbey and Mr. A. W. Mooro. May I suggest that a trial of cellulose splints would overcome some of their difficulties regarding plaster application. It strikes me they are experiencing similar difficulties to those met with in this country years ago, when surgical cases were seen in an advancing condition without the help of a team of nurse visitors, propagandists, and preventive workers. With facility for heliotherapy in Egypt there seems no reason why conservative methods and earlier diagnosis should not gain the mastery there as they have done here.

[2] To be obtained from the British Celanese, Ltd., 8, Waterloo-place, London, S.W. 1.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF OBSTETRICS AND GYNÆCOLOGY.

AT a meeting of this section held on June 5th, Dr. CUTHBERT LOCKYER, the President, being in the chair, a series of three papers were read on the subject of

Wounds of the Gravid and Non-gravid Uterus,

being a study of uterine scars from the Gynæcological Department of the Glasgow Royal Infirmary.

Prof. J. MUNRO KERR dealt with the subject from the clinical standpoint, and started from the assumption that as the technique of gynæcological surgery gradually improved, it was necessary to realise increasingly the importance of conservative procedures in respect of the uterus. The operation of myomectomy was being gradually perfected, and most surgeons nowadays favoured conservative Cæsarean section in preference to sterilisation of the patient, all with the idea of conserving the uterus so that it could perpetuate its great function, and in order that in future pregnancies, should such occur, there would be no risk to either mother or child. Therefore, he contended, the profession could not rest content with an operation which gave 12 to 15 per cent. of mishaps in subsequent pregnancies. Myomectomy at the present time particularly concerned the gynæcologists, for two reasons. First, because the possibilities of the operation were not sufficiently appreciated, many performing hysterectomy when myomectomy was the more desirable operation. Many general surgeons who entered this region did not appreciate the extent of the conservative surgery which was possible. The second reason was that electrical and radiological experts with little knowledge of gynæcology carried out electrical treatment on these patients when such treatment was quite inadvisable. He ranged himself among those who contended that extensive myomectomies could be performed with gratifying results, and the operation should be developed and encouraged, in contrast with electrical treatment. He described the operation for resection of a uterus bicornis, which was done on one of his cases. The patient was aged 25, and when seen by him was two and a half months pregnant. As the cervix was dilated and the ovum could be felt through it, it was clear that it was not an extra-uterine pregnancy; but he could not decide whether it was a myoma complicating uterine pregnancy or a pregnancy in a double uterus. There was found to be a pregnancy in the right half. Later she had a second abortion in the right horn. He delivered a living child, but it died on the twelfth day of asphyxia following on the injuries at birth. Cæsarean section was done later, and a living and healthy child delivered, both returning home well. He did hysterectomy for her, as she dreaded another pregnancy. The scars were found to be good, and they consisted largely of fibrous tissue; they stood the strain of two pregnancies and two labours.

Prof. Kerr next described the case of a woman with a uterus having a rudimentary horn. Removal of the horn stopped the dysmenorrhœa, and some time afterwards she married and had an easy parturition. Since then she had had another labour, and that too was easy. He then described wounds in the uterus due to perforation of that organ with a sound. A specimen showed that very complete regeneration of muscle fibres might occur in a small wound of the uterus, but he did not think that was likely with a large wound in substance which was predominantly muscular; in such the scar would always be largely fibrous.

A fourth group of cases he dealt with were those in which Cæsarean section was done through the active contractile portion of the uterus. A number of such wounds were found to be defective and they gave way during subsequent pregnancy or labour. The scar seemed to be defective on its inner side, where there was a gutter. Infection of a wound was a most important factor in unsatisfactory unions, and another important factor was the material used for stitching the wound. Uterine muscle fibres during the puerperium were in a state of degeneration, and the sheaths of muscle forming the uterine wall were irregularly distributed and might not be exactly coapted. In conservative section the incision should be made over the lower uterine section, as this was less vascular than the upper and the surfaces of the wound could be more precisely approximated; moreover, it was more passive, and healing had a better chance. The mucous membrane should be separately stitched with very fine catgut or silk, and the edges of the fibro-muscular wall must be carefully coapted. He knew of no ruptures having subsequently occurred following this procedure, though the operation must have been performed thousands of times, especially in America and in Germany.

Dr. DONALD MCINTYRE showed by the epidiascope a large number of slides illustrative of his studies of various kinds of uterine scars, as well as a series of actual specimens. In a case of uterus unicornis there was shown to be fibrous thickening of the serous layer running into the myometrium, and in the deeper layer cicatricial tissue was present. In one case in which the ligature used was of silk minute strands of silk were found, surrounded by giant cells. The line of suture could be traced along an irregular course, and along this tract the fibrous tissue was increased in amount. Examination of scars after Cæsarean section showed that the muscle regeneration was perfect. When chromicised gut was used as the suture material there was no subsequent indication of the line of the suture. When unabsorbable material was used the ligatures might make their way to the exterior through the bladder, and the ligatures must cut through muscle before becoming free. In the majority of cases in which silk was used the knot remained intact. He had suggested to makers a combination of catgut and silk as a material for ligatures, and experiments had been made in three or four forms, specimens of which he showed at the meeting.

Dr. JAMES HENDRY dealt with observations made on the uterine scar after Cæsarean section: first, when the incision was made in the active contractile portion of the uterus; secondly, when it was made in the lower uterine segment. It was, he explained, a clinical supplement to the other two papers. At the second pregnancy after Cæsarean section he found no post-operative adhesions. The surface of the uterus might appear to be uniform, but to the finger passed over the surface depressions were evident, they could be felt rather than seen. In the first series—i.e., where the incision was made in the active contractile portion—the previous uterine wound could easily be traced, and there were a series of depressions, the inference drawn from this being that those areas were the seats of the original ligatures. Adhesions of a very dense type were present. In one case he did a classical Cæsarean section in August, 1921, and the uterine wound was closed with interrupted silk sutures. The abdominal wall healed by first intention, and the patient left the hospital on the twenty-third day. She returned three months ago stating that for six months she had felt what seemed like a knot in her womb, which swelled up when her periods occurred. He cut down and found a nodule the size of a green pea, but the scar appeared normal, as did the uterus. The nodule was excised and was found to consist of endometrial tissue encapsuled in white fibrous tissue. Another patient was readmitted complaining of urinary disturbance. A calculus was found with a silk ligature embedded in it; this was shown.

With regard to incision into the lower uterine segment, since May, 1921, he had carried this out in 41 cases. He incised transversely the loose peri-

toneum, and it was not necessary to disturb the bladder very much. The uterine wall was incised transversely. He now used two layers of continuous catgut for the uterine wall. In seven of the 41 cases the inner silk ligature was discharged per vaginam some time after the operation, and he had not experienced trouble from the ligatures in any other stage. The scar was indicated by a white line in two of the cases, and at the second operation that line was found to be free from adhesions. He set out in detail his reasons for choosing the incision in the lower uterine segment.

Discussion.

Dr. T. W. EDEN said the communications were of extraordinary interest, especially the portions dealing with the Cæsarean section scar. In days gone by Cæsarean section interested those of the specialty from the point of view of its indications, but that question had now been settled, and all that remained to be discussed in that relationship was the remote effect of incisions in the uterus. The way in which the operation had been popularised and was being done, not only by gynæcological experts but by surgeons and practitioners everywhere, rendered questions of technique as important as any surgical question existing at the present time. The amount of work which had been put into the subject by the three gentlemen who had read the papers was therefore of great value. Any degree of uterine sepsis during convalescence from Cæsarean section was a most important factor in the production of a weak scar afterwards. He had not regarded the material used for the ligaturing as a matter of great importance, and for many years he had been using only catgut; but he recognised that a great determinant of whether the uterine scar would be a sound one or not was the degree of sepsis present at the time. He asked whether one could ever expect a good uterine scar. That could only be settled by direct observation; but he had not understood why an end-to-end suture in the intestine, which was a contaminated structure, healed in a way which never caused weakening, while in the uterus it did not. The grave part of the communications had been that, even where there was an aseptic recovery, there might be a bad uterine scar. One reason was because the endometrial half of the wound was liable to heal badly, and a second reason was that the scar was liable to be invaded by endometrial tissue in a parasitic fashion, which produced another weak spot. Possibly the V-shaped depression in the inner half of the uterine scar might be got over by improvements in technique, but one could not control decidual tissue, and if it was likely to invade the scar and lodge into spaces it would be filled up by menstruation, and there would be a further weakening of the scar. Thus the gynæcologist was up against difficulties which he could not overcome. Perhaps the lower uterine segment operation would get rid of some of the difficulties, but he did not think it was altogether clear, from the histological points brought forward in the communications, that the lower uterine section scar would be perfect; there would be some risk of endometrial invasion, and even in that some irregularities of union had been shown.

Mr. EARDLEY HOLLAND said these contributions furthered the claims to superiority of the lower uterine section operation over the classical operation. From his experience of repeat operations he could say he had seldom, if ever, seen a perfect scar after a classical Cæsarean section. Constantly he saw scars which seemed perfect, but seldom were they free from one or several pits. With a finger in the uterus and one outside they could be palpated. He had done the lower uterine segment operation only 12 times, and he had found it a delightful operation in cases when the patient had been in labour, and not necessarily only when the labour had lasted some time, for it was so when the patient was no more than halfway through the second stage, as there was an appreciable development of the lower uterine segment. The operation was almost bloodless, one went through thin tissues which did not bleed, there was no need to hurry, and the fœtus was not jeopardised. It seemed as if one was extracting a fœtus through a fully dilated os. Performing the operation before the patient was in labour, however, had disadvantages. He made a curved incision with its convexity downwards, and a remarkably small incision was needed. He considered that the lower uterine segment incision had a great future, and that it would replace the ordinary classical Cæsarean section, at all events in the cases in which one expected the patient to have a repeat operation.

Dr. H. RUSSELL ANDREWS said the most alarming feature about the sections which had been shown was the depth to which the endometrium dipped in. The danger of having a weak scar was due to decidua getting into the layers of muscle. When there was more bleeding than usual in a case it was difficult to make sure of avoiding endometrium, and it was well to have more than one layer of sutures through the muscle. When once a patient had had a Cæsarean section, one felt one could not safely allow her again to have a labour in the ordinary way.

Prof. MUNRO KERR, Dr. MCINTYRE, and Dr. HENDRY replied briefly.

EDINBURGH MEDICO-CHIRURGICAL SOCIETY.

A MEETING of this Society was held on June 4th, Sir DAVID WALLACE, the President, being in the chair, when Mr. J. W. DOWDEN read a paper on the principle of

Active Movement in Relation to Injury and Disease.

After briefly describing the anatomy and physiology of injury, Mr. Dowden said that a study of these subjects pointed to active exercise as the best remedy we had, not only for such conditions as fractures and sprains, but in many post-operative conditions. Amongst these he classed infected joints, infected tendon sheaths and cellulitis, and suppuration. Active movements were essential and should be commenced at once and carried out up to the point of producing pain. The patient must be encouraged daily to persevere in using his own muscles and his own brain. Passive movement and massage were not enough. It was his custom to commence active movements within 24 hours, and it was remarkable to see how the patient gained confidence and to what an extent the range of movement increased in a short time. By this means the tone of the muscles was kept up, adhesions were never allowed to form, and by the active contractions of the muscles the injured bones were gradually welded into shape and, in cases complicated by suppuration, the accumulating pus was driven from the wound. The paper was illustrated by many lantern slides which demonstrated in a remarkable way the healing processes in fractured bones after treatment by active movement. By following up cases for several years the speaker was able to show how perfect a functional result could be obtained, and he also had had the satisfaction of having X ray examinations which revealed no sign of previous injury in the bones.

Mr. C. W. CATHCART, congratulating Mr. Dowden on the success which had attended his work, said that great credit was due to him for the manner in which he had extended the work of Lucas-Championnière.

Mr. J. W. STRUTHERS said that while he had been much impressed by all that he had heard and seen of Mr. Dowden's work, he would have liked to have known more about Mr. Dowden's methods in the treatment of those difficult fractures which occurred now and then in the lower extremity. Most of the cases described were injuries of the arm in young persons.

Mr. PIRIE WATSON, Dr. D. HUSKIE, and Dr. J. W. SOMERVILLE joined in the discussion.

Dr. D. MURRAY LYON read a paper on the

Rôle of Dieting in Medicine.

By way of introduction Dr. Lyon briefly traced the history of dieting in medicine. Dieting was probably as old as medicine itself, for many diseases were accompanied by gastric upset which would call for a modification of food intake. Considerable progress was made along these lines by the empiricists, but the advent and application of organic chemistry and modern physiology had put the subject on a sound basis. Serious gaps still existed in our knowledge of many diseases, and dietetic systems based on faulty foundations had given rise to many fads and fancies. The primary objects in feeding were to supply heat and energy for the body and to allow for growth, storage, and replacement. When fats and carbohydrates were completely combusted in the body, they were said to yield exactly the same number of calories as they did when burnt up in the bomb calorimeter, but in the case of proteins combustion was not so complete, for the resulting end-products had still a heat value. Mellanby had suggested that too much attention had been directed to the calorie, and that other factors, such as the quantity and composition of the protein fraction, must be considered. The diet must include a minimum amount of protein containing certain amino-acids. Fats were of less importance, but the carbohydrate minimum was also fixed if acidosis was to be avoided. Other factors which must be present in the food were the various salts and bases and also the elusive vitamins. Dieting had proved of paramount importance in diabetes. Until recently the practice in treating diabetic patients had been to forbid the consumption of certain foods and to allow other articles of diet *ad libitum*, but a trial of Allen's principles taught us the enormous importance of regulating the diet. Insulin had further altered the outlook, for its use demanded the most careful dieting if hypoglycæmia was to be avoided. Dr. Lyon then proceeded to discuss some of the recent work done by Shaffer and Woodyatt, and pointed out its bearing in the construction of diabetic diets. The patient's glucose tolerance limited his intake of fat, and with regard to protein an amount equivalent to about 1 g. per kilo of body-weight was allowed. A fatty substance known as intarvin had recently been introduced which was almost equivalent in calories to an equal weight of butter, but, according to its discoverer, entirely harmless when taken *ad libitum*, since the organism could deal with it without the aid of carbohydrates and without giving rise to acid bodies. In nephritis considerable discussion had taken place regarding the diet. In the acute stages and in chronic cirrhotic lesions where nitrogenous retention was present it seemed desirable to limit the protein intake, but prolonged albuminuria meant a draining of protein from the system, and the practice of boldly raising the protein in the food had often given rise to apparently beneficial results. Where œdema was present attention to the salt content of the food was recommended, but in some cases restriction of the NaCl had no influence on the diet, and the author was tempted to ask whether any benefit could be derived from dieting such cases at all. Of the plans for treating peptic ulcer Dr. Lyon had had greatest success with the method put forward by Sippy. The principles here were to avoid those things which would call forth the gastric juice, to give small meals at frequent intervals and at the same time to secure for the patient sufficient calories. Under this régime pain ceased at once and within a few days a noticeable increase in weight took place. The science of dietetics was not only of interest to the physician, but was also of importance to the surgeon. Much could be done by dieting to put a patient into the best state for operation, and careful attention after surgical assistance would give the invalid the best chance of permanent recovery in the case of many gastric conditions.

Discussing the question of dieting in hospital practice, Dr. Lyon described what had been done by the institution in nearly all large American hospitals of a special class of official known as a dietitian. The position and duties of these people varied, but they were responsible for the preparation of the food, acting on the prescription of the physician in charge of the case, and by this means an unlimited number of cases requiring special diets could be handled without adding to the work of the ward staff. Another important duty of this official was to instruct those patients who required it in the best methods of constructing, preparing, and arranging their diets. From his experience at the diabetic out-patient clinic of the Royal Infirmary Dr. Lyon was convinced that the exact dieting required in this disease could be satisfactorily and readily carried out in general practice even by uneducated persons. Dieting played a part in preventive medicine, but the more the question was studied the more one was impressed with the multiplicity of causes which acted together in producing ill-health.

Dr. CHALMERS WATSON, in opening the discussion, said that it was necessary to give more attention to the bacterial flora of the intestinal tract before the influence of diet on the patient could be fully understood. He referred also to the great increase in the consumption of meat per head of the population in this country during the last 25 years.

Dr. CLAUDE KER said that from his experience of certain febrile conditions—for instance, typhoid fever—he was tempted to agree with Dr. Lyon and ask if diet in these cases had any beneficial effects at all. Typhoid cases seemed to do equally well on a full diet, on a light diet, or even on practically no diet. He was interested to hear more of the rôle of the dietitian, and now that such an office had been established in the Royal Infirmary he felt sure that it would not be long before a special dietetic kitchen was built, which would be of great help in the handling of those cases which required special care.

Dr. HUSKIE believed that in the construction of diets it was essential to consider the personal idiosyncrasies of the patient.

Prof. G. M. ROBERTSON, Dr. SOMERVILLE, and Dr. C. G. LAMBIE also took part in the discussion.

Mr. PIRIE WATSON exhibited and described a specimen of bilateral hydronephrosis due to blockage of each pelvis by a single calculus.

MEDICAL WOMEN'S INTERNATIONAL ASSOCIATION.—This association will meet in conference in London from July 14th to 19th. The association was inaugurated in New York in 1919, and held a meeting in Geneva in 1922, at which the constitution was drawn up. It is expected that some 24 nations will be represented at this London meeting, the first to be held under the fully constituted representative council. There will be business meetings, and a discussion on Maternal Morbidity, its Causes and Prevention, and there is a full and varied programme of entertainments and expeditions. The hon. secretary of the Hospitality Committee is Dr. Kathleen F. Lander, 49, Albany-street, N.W. 1, from whom all particulars may be obtained.

ENCEPHALITIS LETHARGICA IN NORTHERN IRELAND. A considerable epidemic of encephalitis lethargica has prevailed in Belfast and the surrounding area during the last few weeks. Up to June 6th the number of cases notified in Belfast was 198, with 16 deaths. The attacks, our correspondent writes, have varied much in intensity, some being very mild, others severe. The initial stages have been characterised in some cases by severe neuralgic pains in various parts of the body and choreiform movements, which have given rise to some difficulty in diagnosis. Marked mental perturbation has been common. A mild and irregular pyrexia has been the rule. Double vision has been a frequent symptom, and paralyses of some of the cranial nerves have occurred in many cases. The stuporous condition seems to have been less marked than in the last visitation in 1921, and some patients have had a prolonged period of extreme restlessness, requiring restraint. The disease has not spread in households, and there has been hardly any definite evidence of direct infection. The cases have occurred sporadically in various parts of the city, and neither age nor social position seems to have much, if any, influence. It is too soon yet to draw any conclusion as to the prospects of complete recovery. Many cases have run a protracted course.

Reviews and Notices of Books.

CARDIOLOGY.

Modern Methods in the Diagnosis and Treatment of Heart Disease. By FRANCIS HEATHERLEY, M.B., B.S. Lond., F.R.C.S., Temp. Capt. R.A.M.C., Superintendent Heart Clinic, Manchester; and Cardiologist to the Ministry of Pensions. London: Baillière, Tindall and Cox. 1923. Pp. 199. 5s.

THIS volume of 200 pages was written at the suggestion of a colleague with whom the author was associated while acting as cardiologist to the Ministry of Pensions at Manchester. The work was undertaken with the object of presenting to the general practitioner a sketch of our present-day knowledge of heart disease. It is not intended as a text-book, and is only a general outline of the common disorders of the cardiovascular system, without reference to the special and well-known methods of instrumental examination. The book has been submitted to Sir Thomas Lewis and Dr. John Hay for their criticism and it is apparent that much of the information given in this small volume comes from the published works of these well-known authorities.

In the opening chapters the author contrasts the modern conception of heart disease with the older views. There is a chapter on the arrhythmias, which should be helpful to the general practitioner who has had no experience with polygraphic and electrocardiographic methods. There is a good description of heart failure with congestion; in dealing with heart failure of the anginal type the teaching of Mackenzie has been followed. Pain, breathlessness, palpitation, giddiness, and other symptoms of myocardial exhaustion are briefly considered in the light of recent investigations, and the physical signs of structural disease of the heart are treated in a similar manner. A short chapter on prognosis and treatment includes a helpful account of the procedure to be employed in getting the patient with auricular fibrillation under the influence of digitalis.

This book can be recommended to practitioners, as showing the methods which the medical officers of the Ministry of Pensions have employed with great success in dealing with cardiovascular disease.

The Heart. By Dr. SELIAN NEUHOF, B.S., M.D., Visiting Physician, Central and Neurological Hospital; Consulting Cardiologist, Broad-street Hospital, New York. London: Stanley Phillips; Philadelphia: P. Blakiston's Son and Co. 1923. Pp. 701. $10.00.

THE aim of the author in publishing this book is to present the entire subject of cardiac and cardiovascular disturbances and diseases in a clear, well-balanced manner from the clinician's rather than from a highly specialised viewpoint. He has succeeded in this aim, for his book covers the entire field of cardiovascular disease, functional and structural, in an admirable manner. He has written a book of 700 pages in readable English, well illustrated, with many diagrams, tracings, and electrocardiographic curves, and an inclusive bibliography.

The book is divided into two parts, the first, of 33 chapters, covers the whole field of cardiovascular disease. The opening chapters deal with the embryology and anatomy of the heart, the fœtal circulation, and congenital malformations in the usual text-book manner. In an early chapter there is an adequate discussion of our present-day knowledge of the physiology of heart muscle. Cardiac histology and pathology are briefly treated with two good paragraphs on hypertrophy. In summing up our knowledge of the dynamics of a normal heart cycle and its clinical application to cardiac dilatation, the author is of the opinion that such dilatation unless extreme is not easily recognised, and that we should use the term cardiac dilatation with great caution. Many pages are given to graphic methods; he explains the use of the Mackenzie polygraph, and how radial and venous tracings should be analysed. The principles of electrocardiography, the use of the Einthoven string galvanometer, and the interpretation of curves, are described in a manner suitable for a text-book of this nature. All the essential information upon the arrhythmias is contained in three chapters of 80 pages, each type of irregularity being illustrated by many polygraphic tracings and electrocardiographic curves. In the chapter dealing with the X ray examination of the heart, orthodiascopic standards are accepted as representing accurately the size of the heart. Telerontgenography gives excellent results, but lacks many of the advantages of orthodiascopy for clinical purposes. There is a very good description of the physical signs associated with cardiac enlargement and valve disease. In the discussion of systolic murmurs the statement is made that organic murmurs are easily distinguished from non-organic murmurs. This view is not generally accepted. In the chapter on heart failure, the symptoms and signs associated with it, the functional tests for estimating cardiac reserve, are well dealt with. In his description of the clinical features of subacute infective endocarditis, the author fails to mention clubbed fingers as a valuable sign of this disease. Cardiac syphilis is treated in the usual text-book style, and the remaining chapters conclude a comprehensive outline of cardiovascular disease which should be helpful to both student and general practitioner.

Part II. consists of a series of cardiovascular clinics in the form of case-histories given as a course of clinical conferences to senior students of medicine. The volume is well bound and printed on good paper, with not more than the usual number of typographical errors.

Der Einfluss tiefer Atmung auf den Herzrythmus und seine klinische Verwendung. By the late Dr. ALFRED PONGS, Privatdoz. f. innere Medizin, und Oberarzt d. med. Universitäts-Klinik zu Frankfurt a/M. Berlin: Julius Springer. 1923. With 160 tracings. Pp. 326.

THE well-known sinus-arrhythmia is dealt with at some length from a theoretical and experimental point of view, and the alterations in the heart-rhythm in both general and heart disease are exemplified by the description of numerous cases under the author's care. There is, unfortunately, no index; but the book should appeal to the clinician no less than to the cardiologist.

A Key to the Electrocardiogram. By LOUIS FAUGERES BISHOP, M.A., M.D., Sc.D., F.A.C.P., Professor of the Heart and Circulatory Diseases, Fordham University, U.S.A., School of Medicine, New York City. London: Baillière, Tindall and Cox. 1923. Pp. 96. 15s.

THESE 15 chapters are an expansion of papers read at different times before specialists and general practitioners. It is doubtful whether a reader without knowledge of electrocardiography will find the book helpful in understanding the mechanism of the heart-beat, or useful in distinguishing normal from abnormal electrocardiographic curves. To illustrate the exactness of electrocardiography in the clinical examination of the heart as compared with auscultation, the author, in the preface, compares the movements of a frog in a closed box as determined by listening to the sounds made by the animal, with watching the movements of strings attached to its legs. This is typical of the style in which this book of 96 pages is written. In his efforts to explain the irregularities of the heart and other signs revealed by the electrocardiograph, the author in discursive style employs similes and metaphors which are sometimes useful but sometimes untimely. In attempting

to explain in simple terms the principles of electrocardiography, he fails to give a true impression of the real value of the galvanometer in the clinical examination of the patient with cardiovascular disease. In the appendix there is a photograph of the Hindle electrocardiograph, and directions are given for the installation of an electrocardiograph, and the procedure usually adopted in taking an electrocardiographic curve. In this country the galvanometer in general use is the instrument made by the Cambridge and Paul Instrument Co. Directions given for the Hindle will not apply to the Cambridge and Paul instrument.

MICROBIOLOGICAL TECHNIQUE.

Handbuch der mikrobiologischen Technik. Edited by Prof. R. KRAUS (Vienna) and Prof. P. UHLENHUTH (Freiburg, i/B). Berlin: Urban und Schwarzenberg. 1924. Vol. III. Pp. 987. Swiss Fr.41.25; bound, Swiss Fr.45.75.

THE third volume of this handbook contains a number of chapters of interest. The late Prof. A. Klöcker, of Copenhagen, deals with the cultivation of yeasts. This chapter is followed by a well-illustrated one on pathogenic fungi for which Prof. H. O. Plaut, of Hamburg, is responsible. Insects of pathological importance are dealt with in chapters by Dr. A. Lutz, of Rio de Janeiro, and Dr. R. Haas, of Berlin, respectively; the latter also describes methods for breeding and handling them. Chapters follow on pathogenic worms, on filarias, on soil organisms, on the microbiological investigation of milk, of water, and of air. A brief chapter by Dr. T. Péterfi gives an account of the new subject of micro-dissection, here called the "micrurgical method," which has been developed and practised until now almost exclusively in America. The most interesting chapters are those by Prof. W. Rosenthal, of Göttingen, on the technique of filtration and ultra-filtration with special reference to the isolation and demonstration of the filterable viruses. These two chapters give a very complete account of the whole subject and contain a remarkably extensive bibliography of nearly 700 references. A number of chapters on the organisation and equipment of bacteriological institutes complete the volume—a somewhat unnecessary addition to a very bulky tome.

The work contains much information which is not readily found in the ordinary text-book and should prove a useful book of reference.

MODERN THEORIES OF THE UNCONSCIOUS.

By W. L. NORTHRIDGE, M.A., Ph.D. With an Introduction by Prof. J. LAIRD, M.A. London: Kegan Paul. 1924. Pp. 194. 8*s.* 6*d.*

Dr. Northridge gives an account of early theories of the unconscious as propounded by philosophers, and shows their relation to and contrast with modern theories, which, he says, have been built up out of a close study of mental data and, for the most part, with a practical aim. The views of these philosophers are given with a scarcity of dates which is unkind to the tyro. One can, for example, only discover by close reading that Hartmann's "Philosophy of the Unconscious," in spite of its apparently up-to-date title, belongs to the period between Schopenhauer and William James. One of the few dates provided is, however, of interest. Thomas Reid wrote that "every operation of our mind is attended with consciousness, . . . and to speak of perceptions of which we are not conscious is to speak without any meaning." This reads like a fragment of current controversy, but was written in 1785. W. H. Myers is taken as the first exponent of modern ideas, though his introduction of a "supernal faculty" made his "subliminal self" a confusion of two conceptions. The development of theory is traced in the work of Janet, Morton Prince, and others, and a critical and historical account is given of Freud's psycho-analytical practice and theory. The author dismisses Jung's "collective unconscious" as unnecessary, and agrees with Rivers in denying that repressed sexual tendencies are always the real cause of a neurosis. To justify this conclusion he quotes the result of an analysis which lasted only six sittings and removed the symptoms after the abreaction of experiences which the patient had "largely succeeded in banishing from her mind." Psycho-analysts would certainly reply that no true analysis took place.

Dr. Northridge struggles with the difficulty of conceiving unconscious mental processes which possess all the attributes of conscious ones except that the subject is not aware of them, and finds it too great. Writing in no carping spirit, he declares that "There cannot be 'unconscious ideas' or 'unconscious wishes' unless what introspection reveals to us of our conscious processes is hopelessly astray." This sums up the position perhaps better than the author realises, and accords with other passages in which he shows his reluctance to give up a belief in the unchallenged supremacy of the consciousness. Unlike other objectors to the theory of the unconscious, he has found it to be true that those who pour scorn upon psycho-analysis will understand its value if they put it to the test themselves. His own tentative formula for the content of the unconscious is unsatisfying, and it seems that for those who share his difficulty the only escape is to accept the current theory with the proviso that some things happen as if it were true, but other things contradict it.

The historical part of the book should lead psycho-analysts to look with respect upon pre-analytical philosophers. Dr. Northridge's practical contributions are too slight to be of value in themselves, but there is so much a priori denial of psycho-analytical findings that one welcomes the advent of a critic who has put the principles to the test of practical investigation.

TOPOGRAPHICAL ANATOMY OF THE HEAD AND NECK OF THE HORSE.

By O. CHARNOCK BRADLEY, M.D., D.Sc., M.R.C.V.S., Principal, Royal (Dick) Veterinary College, Edinburgh; Lecturer on Comparative Anatomy, University of Edinburgh. Edinburgh: W. Green and Sons, Ltd. 1923. With 96 illustrations. Pp. 228. 21*s.*

THE present volume forms the last of three by the same author dealing with the topographical anatomy of the horse, the limbs and trunk having already been considered. The aim of the work is the same as that of its admirable companion volumes—viz., to act without over-elaboration as a dissection guide. Its appeal is therefore directly to the student, and although the head and neck are not of same daily importance to the practitioners as the limbs and trunk, it should also be of value and interest to him. Over 40 out of a total of 214 pages are devoted to the brain, spinal cord, and their coverings. The directions, descriptions, and illustrations are of the same high standard as in the earlier volumes. There are good tables and a full index. An ambiguous statement appears in the first sentence on p. 180, where under cerebral nerves the author states: "Twelve pairs of nerves arise from each half of the brain." This surely must be double the actual number. The work will undoubtedly be used in those veterinary schools where modern nomenclature is taught.

AIDS TO PRACTICAL PATHOLOGY.

By F. W. GRIFFIN, M.A., M.D., B.C. Camb., Assistant Pathologist; and W. F. M. THOMPSON, Chief Technical Assistant, Virol Pathological Research Laboratories. London: Baillière, Tindall and Cox. 1923. Pp. 246. 4*s.*

IN this volume the authors have faced the formidable task of bringing together for the use, not only of students and practitioners, but also of laboratory workers, the great bulk of the procedures more commonly used in bacteriological, histological, and

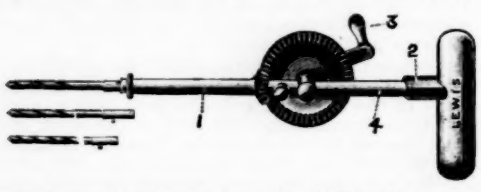
biochemical investigations. Notwithstanding the fact that the book contains only 246 pages, being of the compact and handy format of all its predecessors in the "Aids" series, there is hardly any well-recognised procedure of laboratory diagnosis that fails to find place therein. The descriptions of the technique of the various methods are clear and to the point. The wholly inexperienced might find it difficult to work from the book alone, but most of the descriptions are such that any given method, or a kindred one, having once been performed under supervision, it should be possible for a worker of reasonable intelligence to carry on by the book.

It is a reflection of the spirit of the medicine of the day that most of the bacteriological technique is compressed into the first 45 pages; the bulk of the remainder of the book is devoted to biochemistry, the methods of morbid histology coming in for a scant 18 pages at the end. The whole is severely practical; as a cram-book it might well be productive of "brain fever," but as a bench manual, both for the present-day medical student and the laboratory worker, it will be of real value. Some references are given; more would have added to the value of the book.

New Inventions.

AN IMPROVED BONE DRILL.

I WISH to bring to the notice of your readers an improved bone drill (see figure) which I have had made to my design. Its object is to avoid the faults of the ordinary bone drill—namely, (1) defective balance; (2) insufficient length; (3) uncomfortable handle; and (4) a gear-wheel handle which does not revolve freely on its axis. In the improved bone drill (1) the instrument balances at the spot marked 4 in the figure, and as a consequence seems almost to retain itself at right angles to the bone automatically without any muscular effort on the part of the surgeon, and



without any tendency for the drill-point to snap off in the bone; (2) the stem which holds the detachable drill-point has been doubled in length, marked 1, enabling the drill to be used in the deepest wound without the surgeon's hand coming anywhere near it; (3) the tiring of the fingers, in consequence of the unsuitable shape of the part of the stem which meets the handle at right angles, is obviated by making this part of the stem marked 2 flattened from above downward; (4) the handle revolves freely on its long axis, but has no projecting milled head or screw of any kind, and one can turn it for any length of time without the glove becoming caught and damaged with the consequent spoiling of aseptic technique. Briefly, the merits of the instrument are that it balances itself without any conscious effort on the part of the operator: there is no fear of the drill-point snapping off, the drill can be used without the hand of the operator entering the wound, and without his glove getting torn. Any number of holes can be drilled without causing the slightest fatigue or discomfort.

Messrs. Lewis and Sons, 2, Westmoreland-street, London, W.1, are the makers.

PAUL BERNARD ROTH,
Orthopædic Surgeon to the Miller General and Homœopathic Hospitals.

Reports and Analytical Records.

FRIARY NON-DEPOSIT DINNER ALE AND FRIARY DOUBLE STOUT.

(FRIARY, HOLROYD AND HEALY'S BREWERIES, LTD., GUILDFORD.)

THESE two samples of bottled beers have been submitted to us for examination. When analysed the following results were obtained:—

	Dinner ale.	Double stout.
Specific gravity of wort before fermentation	1038·15°	1039·68°
Present specific gravity	1011·94°	1013·02°
Alcohol per cent. by volume	3·4	3·5
Extractives per cent. (total soluble matter)	4·3	4·6
Acidity per cent. as acetic acid	0·07	0·08
Original wort solids fermented, per cent.	56	55
Fermentable sugar still present, per cent.	0·75	0·83
Preservatives (salicylates and sulphites)	Absent.	Absent.

Both beers were in good condition, brilliant and entirely free from deposit. They were extremely palatable, and have clearly been brewed from high-class materials on sound lines. The pleasing appearance of the ale and stout in glass and the attractive and novel get-up of the bottles indicate that the proprietors of this well-known brewery appreciate the æsthetic aspect of marketing our national beverage.

"BILINA": NATURAL DIGESTIVE WATER.

(THE INTERNATIONAL DEVELOPMENT CO., LTD., 4, TRAFALGAR-SQUARE, W.C. 2.)

This water is derived from springs situated close ot the town of Bilina in Czecho-Slovakia. When analysed it was found to have the composition (expressed as grains per gallon):—

Chlorine (Cl)	11·87
Sulphuric acid (SO_3)	35·05
Lime (CaO)	12·15
Magnesia (MgO)	4·54
Silica (SiO_2)	2·80
Soda (Na_2O)	135·04
Potassium and lithium	Traces.
Specific gravity (water = 1000)	1004·46

These are probably combined as follows:—

Sodium chloride (NaCl)	19·58
„ sulphate (Na_2SO_4)	62·15
„ bicarbonate ($NaHCO_3$)	264·4
Magnesium bicarbonate ($Mg(HCO_3)_2$)	16·5
Bicarbonate of lime ($Ca(HCO_3)_2$)	35·1
Silica (SiO_2)	2·8
	400·53

This is a somewhat remarkable water of the Vichy type, and the bulk of the saline constituents are in the form of bicarbonates. The water is well charged with carbonic acid gas, and it possesses the agreeable salty taste characteristic of bicarbonate of soda. The sodium sulphate present confers on it slightly laxative properties.

ENERGEN BREAD.

We have received the following communication from the Therapeutic Foods Co., Willesden, London, N.W.:—

"In the report published under the above heading in THE LANCET of May 24th we notice the observation 'that the manufacturer should state the percentage of carbohydrate in his product, since this practice would be of great assistance to the physician in prescribing a diet.' We are entirely in agreement with this view. This Company has always issued to the medical profession complete analyses of all the Energen products, and these are at the disposal of any physician who may be good enough to apply to us for them."

THE LANCET.

LONDON: SATURDAY, JUNE 14, 1924.

EPIDEMIC DISEASE IN THE FAR EAST.

As an outcome of a proposal put forward by Dr. MIYAJIMA, the first Japanese representative on the League of Nations Health Committee, to that Committee, a mission was despatched at the end of 1922 to the Far East to collect information in regard to the incidence of epidemics in important ports where international complications might be expected and where measures were necessary to prevent the transmission of these diseases to other centres. The original proposal was to form a mission of three or four public health experts of high standing in their different countries, but Dr. NORMAN WHITE undertook the inquiry single-handed, as it was found difficult in the time available to nominate other authorities who could be spared from their posts for as long a period as six months. Dr. MIYAJIMA accompanied the mission throughout the visits to Formosa, Korea, and South Manchuria; and in the part of the tour which covered Hong-Kong, Shanghai, and Japan, Dr. H. F. SMITH, of the Public Health Service of the United States, also acted as an unofficial and valuable colleague, but the resulting report of the mission must be looked upon as practically individual.

The scope of the inquiry was large, as befitted so fundamental an idea. It was proposed to include in the report not only the ascertainable facts on the incidence of the most important epidemic diseases in the various ports of the Far East over a period of five years, and to note the part played by shipping in the spread of infection and the efficacy of quarantine regulations, but also to discover the possibility of diffusing useful information upon epidemic outbreaks and endemic pestilences among the constituent nations, to provide a scheme for the interchange of experiences, and to frame some form of convention for regulating national and international efforts along the indicated lines, securing especially uniform procedure in the chief ports in respect of public health and quarantine regulations. In many ways the report meets this large reference satisfactorily. The total distance covered in Dr. NORMAN WHITE'S itinerary was 35,000 miles, exclusive of short journeys of inspection, and the whole of this extensive journeying was accomplished between Nov. 28th, 1922, when he left Bangkok, and July 29th, 1923, when he arrived at Marseilles, some of the principal places visited being Singapore, Java, Hong-Kong, Shanghai, Tokyo, Peking, Saigon, Rangoon, Calcutta, Bombay, and Marseilles. The stay in certain of the ports was necessarily of a limited duration, but in spite of the rapidity of travel and the brevity of the visits an enormous amount of information was collected. This has been compared, amplified, and verified by Dr. WHITE in his report with all the health publications and monographs necessary to complete the various sections of the work; while the investigations on the spot are described in greater or less detail as the facts have warranted, neither formal questionnaire was issued nor was special pattern of inquiry followed. The early chapters deal with plague, cholera, and small-pox in the Far East, plague being given precedence as, all things considered, the most important ship-borne disease in the Orient. The chapter on plague condenses with clearness the more salient epidemiological facts emerging from a study of a history of the disease during 25 years, and among the points on which Dr. WHITE insists are the evidence for considering bubonic plague and pneumonic plague to be two distinct diseases, and the conclusion that the plague bacillus alone cannot cause widespread epidemics of pneumonic plague. Stress is laid on the non-infectiousness of human bubonic plague; this is another way of saying that as an epidemiological problem we are dealing with a rat disease first and last, so that, if it were possible to break the association of rats and grain, the control of the disease might be assured—at any rate, as a ship-borne scourge. The monograph on cholera indicates upon statistical grounds that certain provinces in British India are by far the largest and most persistent centres of cholera infection in the world. Here, says the report, the cholera problem is one of unparalleled difficulty, being bound up with considerations of centuries-old customs, habits, and prejudices, but the attention at last being given to rural sanitation in India should work a vast improvement. The question of small-pox in the Far East is dismissed briefly, though the existence at different dates of serious and widespread epidemics is noted. The view held in the report is that, though the infection is more widespread than with plague or with cholera, the dangers of transferring infection by ship are confined almost entirely to such classes of passengers as labour squads or pilgrims, while the general attention paid to vaccination in all parts of the East minimises these dangers.

There follows an elaborate draft for a sanitary convention between the countries concerned for the control of infectious diseases in the Far East, based upon the results of the mission, to which is appended a Bill of Health form which would be a most desirable one for use in all ports in the Far East where, at the present time, Bills of Health are frequently of little or no value, their object in certain places appearing even to be the express withholding of information. The plan for this convention, as proposed by Dr. WHITE, is not on all fours with the existing International Sanitary Convention of 1912. Some parts of it, indeed, may prove difficult to reconcile with the principles on which the official revision of that Convention is now proceeding. But the draft has the obvious advantage of indicating to governments the kind of problems which may have to be met by some future form of international agreement. The concluding and greater portion of a voluminous and admirable document is occupied by series of detailed facts in respect of the incidence of all epidemic diseases in the special centres visited, with a plea for an international epidemiological intelligence bureau for the Far East. The monographs as they concern various localities are based upon assistance freely offered from many authoritative sources, and Dr. WHITE here, as elsewhere in his report, points out the great help he has received in his work from different quarters where he has found personal acknowledgment impossible, and where he has had no opportunity of submitting the resulting sections to revision by collaborators. All these chapters prove the practical utility that such an intelligence bureau would have, for combinations to delimit epidemics can only be set in motion in response to prompt and precise knowledge. The important functions of the proposed bureau would be to summarise in a convenient form, and to circulate to all signatory countries and to the health organisation of the League of Nations, matters of public health and

statistical urgency. To this bureau each country would state what it considered necessary with regard to ships arriving from an infected country; it would detail the facilities which would be granted on arrival and the measures which would be enforced before departure. The director of the bureau would be in a position to correspond with the port administrative officers, and to these functions others, as they became indicated by experience, might be added. The suggestion to establish such a bureau is in accord with the expressed views of many authorities, and it seems probable that it will be placed before the League of Nations Council at their forthcoming meeting, when Singapore is obviously indicated as the place for such a central station.

A PROBLEM OF NUTRITION.

THE second decade of this century has witnessed a unique experiment in nutrition, in which a whole nation was the test object. The results of this experiment, which was an involuntary one and proceeded in Denmark, are of far-reaching importance. We owe our knowledge of the matter to two Danish physicians, Dr. C. E. BLOCH and Dr. O BLEGVAD. Dr. BLOCH [1] observed in 1917 an outbreak of keratomalacia in a children's institution. He could show that the children, although living on a mixed diet, did not receive a sufficient supply of the fat-soluble vitamin A in their diet owing to the fact that the main supplies of this vitamin in a child's dietary, butter and whole milk, had been replaced by margarine and skimmed milk. Dr. BLEGVAD collected all the cases of xerophthalmia and keratomalacia which had occurred throughout the country during the 12 years 1909–1920. He investigated carefully the conditions under which the disease developed, the age of the children, their food, their general state of health, the economic position of the parents, the seasonal incidence of the disease, and so on, and published this material last year in Danish in a monograph entitled "Om Xerophthalmien." Quite recently he has published a summary of his work in English in the *American Journal of Ophthalmology*. To-day we publish a paper by Prof. E. WIDMARK, of Lund, Sweden, who, on the basis of Dr. BLEGVAD'S work, draws conclusions of great general importance. We learn from Dr. BLEGVAD'S interesting historical account of the disease that it was first defined as a clinical entity about the middle of the nineteenth century by ARLT and a few years later by VON GRÄFE. The ætiology of the disease was so little understood that until the beginning of this century the mortality in infants developing keratomalacia was almost 100 per cent., so that the onset of the disease was regarded as a symptom of imminent death. In 1903 FEHR noted as a curiosity a case of keratomalacia in a baby whom he succeeded in saving from death. And as late as 1913 a publication based on 93 cases gave a mortality of 50 per cent.

The discovery of vitamins has revolutionised the outlook on this disease. It has been possible to reproduce the disease experimentally in animals by keeping them on a diet poor in the fat-soluble vitamin A and to cure it again rapidly by administering food substances rich in this vitamin, such as cod-liver oil or butter fat. Incidentally Dr. BLEGVAD makes an interesting contribution to the history of medicine by showing that the treatment of night-blindness—an early symptom frequently associated with xerosis conjunctivæ and occurring in badly nourished children—is mentioned in EBER'S papyrus, dating probably from 1500 B.C. The treatment recommended by the ancient Egyptians was the administration of liver, and we know now that of all animal tissues the liver of herbivorous animals and of many fishes is particularly rich in the fat-soluble vitamin. This knowledge seems to have spread from Egypt all over the world. For HIPPOCRATES recommends raw ox-liver dipped in honey, and in Japan and China the liver of hens and of sheep were used. This treatment with ox-liver persisted even to the beginning of this century. Dr. BLEGVAD'S theory is based on 453 cases of keratomalacia, of which all but 19 occurred in children, and 148 cases of xerosis of the conjunctiva without keratomalacia. From a careful consideration of all the factors involved Dr. BLEGVAD concludes that the main ætiological factor of the disease in children is the same as in young animals—namely, a diet poor in the fat-soluble vitamin A. In terms of ordinary foodstuffs the disease in Denmark, at any rate, is due to the substitution of margarine for butter and of skimmed milk for whole milk. All the cases in which the weight of the children were recorded showed a greatly impaired growth. The disease might be called an economic disease. It occurred only among the children of the poorer classes. The treatment consisted in giving whole milk with or without cod-liver oil. In BLOCH'S cases, which could be treated in an institution, and where, therefore, the diagnosis could be made at an early stage of the disease, the mortality was thus reduced to 10 per cent. The mortality of the cases collected by Dr. BLEGVAD was still 21 per cent., mainly owing to the fact that the disease begins so insidiously that the children were not brought to the doctor soon enough. It is a significant fact that the cause of death was nearly always broncho-pneumonia—another striking similarity to the condition observed in animals, which die usually from septic lung conditions. Although the disease itself yields so effectively, vision usually remains damaged. Only 14 per cent. of Dr. BLEGVAD'S cases recovered with undamaged vision, 27 per cent. were blind, and 24 per cent. had vision greatly reduced in both eyes, while in 35 per cent. visual acuity was reduced in one eye.

It would be a mistake to look upon Dr. BLEGVAD'S work merely as a striking illustration of the solution of a clinical problem by the data furnished by experiments on animals, with a corresponding reduction in the mortality from 100 per cent. to nearly 10 per cent. Its significance goes much further. The experience of Denmark has demonstrated beyond doubt that the teachings of the new physiology of nutrition, associated with the conception of vitamins, cannot be neglected with impunity by a community, even though it may live under the conditions of our civilisation on a varied and freely chosen diet restricted only by economic considerations. The widespread belief that since we live on a mixed diet we somehow pick up enough of the necessary vitamins to maintain us in good health is shown to be mistaken. And the extent of the vitamin deficiency must not be gathered from the relatively few cases of the eye disease which have been observed. This is merely a final symptom when the deficiency has reached the extreme stage. It is associated with other disturbances such as malnutrition, anæmia, general debility, diminished resistance to respiratory infections, which make their appearance long before the eye disease develops. As Prof. WIDMARK puts it, for every case of xerophthalmia there is a whole army of patients whose health has been undermined by deprivation of vitamins, but whose diseases get

[1] Journal of Hygiene, 1921, xvii., 283.

other names. The same view has recently been expressed by Dr. W. CRAMER [2] in a lecture published in our columns. He emphasised the necessity of an *abundant* supply of vitamin for the maintenance of health especially in a young organism. He pointed out that one of the results of our present civilisation has been to deprive those foodstuffs, which are the main supplies of vitamins, of their vitamin content, and he gave reasons for believing that this may constitute a serious danger to the health of a nation. The data collected in Denmark and presented by Prof. WIDMARK can leave little doubt as to the reality of this danger. We have a vast amount of ill-health among the children of this country. Sir GEORGE NEWMAN, in his report on the health of the school child, states that while 80–90 per cent. of the children are born healthy, 35–40 per cent. of the children who are admitted to school at 5 years of age bear with them physical defects which could have been either prevented or cured. He does not exaggerate when he describes this as the most serious and wasteful defect in our national health service, and he attributes this appalling result mainly to bad housing, parental neglect, and absence of hygienic supervision, and these are no doubt important factors. But the complete omission of an adequate supply of vitamins as one of the causes of this vast amount of preventable ill-health is striking, though the importance of this factor is as yet little appreciated in this country. Good housing, care, and cleanliness cannot make up for a deficiency in this factor, for the disease xerophthalmia has occurred in institutions where, in spite of repeated investigations, no fault could be found with the conditions of life of the children until the discovery of vitamins gave the clue. The problem of an adequate vitamin supply to the community, which affects the health of the nation so closely, is a vast one; it involves not only medical and biochemical considerations, but is also an economic and a social problem. It well deserves the labours of a Special Committee.

SEX DETERMINATION.

SEX is determined by the sex chromosomes, two in number. In females these are similar to one another, and are generally denoted X and X; in the male they are dissimilar, morphologically and functionally, and are marked X and Y. In the reducing divisions leading to the formation of eggs and spermatozoa these numbers are halved. As a result all eggs have one X chromosome, some spermatozoa have an X, some spermatozoa have a Y. By random fertilisation between eggs and spermatozoa so constituted a population is produced of individuals with XX (which are females) and individuals with XY (which are males) in approximately equal proportions. The sex chromosomes contain genetic factors other than those determining sex, and the qualities determined by these factors are therefore inherited in relation to sex—for example, hæmophilia.

Such in its simplest form is the explanation of sex puzzles which modern histological and experimental work have combined to elaborate into a singularly convincing whole. The whole question is dealt with in a most interesting and comprehensive way by Mr. JULIAN HUXLEY in *Medical Science* (1924, x., 91), and we are glad that the Medical Research Council takes the wide view which enables the readers of its journal to familiarise themselves so conveniently with the present state of knowledge in a subject which has advanced with bewildering rapidity and has almost endless medical implications. Take, for example, the sex-ratio and the possibility of varying the ratio and even of influencing the sex of a particular child. At birth there are about 103 males to 100 females; it is known that fœtal mortality falls more heavily on males, and the primary ratio—i.e., the ratio at the time of conception—is probably about 120 or even higher. Hence, since X and Y spermatozoa are produced in equal numbers, the Y variety must have some advantage. It has been shown that human spermatozoa are of two sizes, and since the Y chromosome is smaller than the X the ones with the smaller heads may reasonably be assumed to be genetically Y or male-determining. It is not difficult to imagine that herein lies the advantage which the Y spermatozoa have, that they are more easily able to burrow about and make their comparatively long journey from the vagina to the Fallopian tubes. And lively eugenic imaginations will see in some method of differential filtering or diffusion a means of getting a boy or girl at will. Profuse copulation is also known to have a considerable influence on the ratio, HAYS' experiments on rabbits bearing out the "vulgar error" that moderation is more likely to result in boys. Artificial selection of inbred stocks may also lead to brands of rats with familial tendencies to ratios as different as 122 and 82. But though maleness has an advantage at the outset, the balance is severely against it afterwards, and, as is well known, the excess mortality among male children reduces the ratio to less than 100 after the first few years of life. The most likely explanation of this is that in the sex chromosomes are carried also recessive factors which, when they become manifest by appropriate matings, are lethal or tend to lethality: such a character is more likely to appear in males with one X chromosome than in females, in which both must be simultaneously affected to produce the result. Or consider the exhibition of sex in secondary sexual characters. Each cell in the body of a female is different in its chromosomes from each cell of a male. But this does not directly lead to differentiation of the secondary characters. Once primary sex is determined, secondary development is brought about by hormones from the gonads, and by alterations in these hormones the fundamental chromosome constitution of the body can be overridden. Hence the effect of castration and the occurrence of sex reversal. The chromosomal mechanism on which this and much more depends is mechanically delicate, and, as may well be imagined, does not always effect its complicated manœuvres with complete precision. Mistakes occur and lead to various pathological results. Similar errors in the other, non-sex, chromosomes may well account for many of the individuals which do not fit the world and come to untimely deaths of one kind and another. Some of these relatively or absolutely non-viable products are also the inevitable result of particular matings of heterozygous individuals, so constituted that some recessive character, in the parents unrecognised and harmless, comes to the front. The thoughtful hygienist will find in Mr. HUXLEY's summary much food for reflection on nature and nurture and the lines along which hygiene must look for progress.

From a more general point of view, one of the most interesting facts brought out is that the arrangements outlined do not hold throughout the animal series. Thus in mammals and diptera—e.g., the famous *Drosophila*—the male has two dissimilar chromosomes, while in birds and moths it is the female that is the heterogametic sex, and the eggs are of two kinds rather than the spermatozoa. In insects, too, the secondary sexual characters, often extremely prominent, are due to the different constitution of the cells which form them, and are not influenced by the gonads: castration with or without implantation of a sex-gland from the opposite sex makes no difference. We have here another illustration of the great biological truth that the end and not the means is the determining factor. The end in this particular case is the production of males and females in something like equal numbers: the means by which this is attained is not always the same, any more than the means by which reproduction and maintenance of the species is always achieved by the sexual process.

[2] THE LANCET, March 29th, 1924, p. 633.

Annotations.

"Ne quid nimis."

CONCERTED CARE OF CRIPPLES.

AT the present time there are about 100,000 crippled children in this country, of whom it is believed that 90 per cent. need not have become cripples had the knowledge we already possess been put to practical use. A business-like scheme of attack was started in the county of Salop in the year 1900, and from this beginning has grown a large work all over the country organised by a central committee, of which Sir Robert Jones is chairman and Dr. F. Barry Lambert hon. secretary. This committee works in close touch with the Invalid Children's Aid Association under a joint board whose chairman is Mr. H. S. Souttar, F.R.C.S. We have just received a report of this Central Committee for the Care of Cripples (Carnegie House, 117, Piccadilly, W. 1), covering the two years 1922–23, which shows steady progress in the organising of the care of cripples in many different localities. In Shropshire the work is so far advanced that the orthopædic hospital no longer has a waiting list, and from Oxfordshire comes the cheering news that comparatively few new cases of long standing are now being discovered. There are 125 beds at the Wingfield Orthopædic Hospital, Headington, Oxford, as well as three small wards for private cases and clinics scattered over the three adjacent counties—namely, Chipping Norton, Witney, Henley, and Banbury in Oxford; Wallingford, Sandhurst, Wantage, Wokingham, and Newbury in Berks; Aylesbury, High Wycombe, and Newport Pagnell in Bucks. It is the experience of the Central Committee that wherever a clinic sets to work there is a constant and increasing flow of cripples as a result, the expectation being three cripple children per 1000 of population. Nowhere else is the work so well organised as in the two counties named, but elsewhere good beginnings are recorded. Two after-care orthopædic clinics have been opened in Cheshire, one at Chester and the other at Crewe; 257 cases were sent within the year from the adjacent counties to the Ethel Hedley Hospital at Calgarth Park, Windermere, where they were visited by surgeons from Manchester. In Essex the Walthamstow U.D.C. has provided free of rent and rates for a year the orthopædic hospital at Brookfield, served by the neighbouring public authorities. During the last two years a clinic has been opened at Hereford, and five orthopædic centres in Hertfordshire (St. Albans, Hertford, Hitchin, Letchworth, and Watford) where the massage clinics originally started for the treatment of ex-Service men are being retained by the county nursing association for orthopædic work. The Central Hospital at Longfields, Stoke-on-Trent, provides 40 beds for the North Staffordshire Cripples' Aid Society. A Red Cross Curative Post at Woking is under the surgical supervision of orthopædic surgeons from St. Thomas's Hospital. In Wiltshire a clinic is being started at Devizes and the open-air ward at Bath has already been noted in our columns. The joint committee of the two cognate associations has made it its aim to provide a clearing house for all cases sent out of orthopædic hospitals with no obvious provision for after-care. There is pressing need for new schools in the country for these children; the cripple has to learn in school hours many things which the normal child learns unconsciously, and in addition he must get a sound vocational training, when he has an 80 per cent. chance of becoming a self-supporting citizen. Unfortunately, in spite of conference with makers it has been found impracticable to standardise splints and instruments so as to reduce their cost by increased production. The ambition of the Central Committee is not to allow any preventable deformity to occur, and work on these lines is making great strides.

ELEPHANTS AND ETHNOLOGISTS.[1]

AN ethnological note, in the form of a well-illustrated quarto volume, has just been published by Prof. Elliot Smith, which, while full of learning and thoroughly documented, has the joyousness of a breezy quarrel. After all, ethnology is a very human subject, and it is very human to enjoy a quarrel. The points at issue may be briefly stated as follows. There are elephants and there have always been elephants in India, and their representation is a frequent feature of decorative sculpture in South and South-Eastern Asia. There are no elephants in America; at any rate, geology produces no evidence of their existence since primeval times. Yet in Honduras, among an imposing collection of ruins, a stela, or decorated pillar, exists adorned with animals which can hardly fail to be recognised as elephants, and bearing also the huge face of a Mongolian. Without dogmatising as to the date of this stela, it is inconceivable that sculpture upon it should have derived any decorative details from some memory of an American primeval beast. How, then, can the ornamentation on the Copan stela, in Honduras, be explained? And why does it need explaining?

The need for explanation arises from the fact that it is a dogma with a certain school of ethnologists that the civilisation which existed in America before the days of Columbus had its origin in the West, and derived nothing from Asia. Identities in primitive customs and nomenclature are justified by the theory that, it being natural for steps in human development to occur along certain lines, there must have been two developments occurring separately, one for the West and one for the East. Things may have been so, but with equal certainty they may not have been so. Why the principle of separate development should be an article of almost religious faith with one class of thinkers is not clear, but from the contents of this book we must assume that to hold a contrary view—as we happen to do ourselves—is an act of impiety. The champions of what may be called the all-America-out-of-America school argue that the ornaments on the Copan stela are not elephants at all but parrots or tapirs, or the result of pure imagination, evolved from the inner consciousness of the ancient artists.

No reply is attempted to those who think that the ornaments are the outcome of mental evolution, and those who would explain the elephants by some accidental similarity between sculptural flourishes and an animal with a trunk are also not to be argued with. No doubt the beliefs are honest, though their basis is frail. The pictures in the book appear to show distinctly the head of an elephant with, in one case, a turbaned *mahout*. The explanation which allows that the carving is intended to be an animal of some sort, and suggests that it is a tapir, does not explain the presence upon it of a turbaned *mahout*. Another explanation is that, scale being admittedly of no consequence, the decoration is a representation of a sort of parrot, the blue macaw, and this interpretation appears to be arrived at by mistaking the inconspicuous eye of the elephant for a nostril, and its ear for an eye. Looked at in this way the sculpture certainly has some resemblance to the profile of a beaked bird, but it must be remembered that there are four beasts on the stela, of which only one, and that the most damaged one, lends itself to the theory. What is the impossibility that the beasts, being elephants, should have been sculptured by persons who, though they had never seen elephants themselves, had seen representations of them, with their *mahouts*? Small articles so adorned could find their way to Honduras from India and China by the medium of adventurous Melanesians and Polynesians. This would explain everything, and requires no violent assumption, for it is known that some of the natives

[1] Elephants and Ethnologists. By Prof. G. Elliot Smith. Woodcuts by A. H. Gerrard and K. Leigh-Pemberton. London: Kegan Paul. Pp. 136. 15s.

made long and adventurous voyages, pushing East, step by step, from island to island, while there is much evidence that the Polynesians had ways and means of reaching America which were employed some centuries before the discovery made by Columbus. What is the absurdity of this theory that should tempt those who disagree with it to be rude about it?

We recommend this book to all who, while valuing the lessons of ethnology, are not aware of the extreme pains necessary to comprehend the ancient messages. Prof. Elliot Smith produces a mass of evidence in support of the view that the influences of Asia might be found in the remains of the pre-Columbian civilisations of America, and Mr. Gerrard and Mr. Leigh-Pemberton have coöperated in a series of remarkable woodcuts. The testimony cannot be pushed aside as supporting "an extravagant hypothesis, long since relegated to the rubbish pile of scientific discords." Such an attitude towards scientific opponents is not to be commended.

ACTION OF TESTICLE ON OVARIAN GRAFTS.

Drs. A. Lipschütz and H. E. Voss have carried out some interesting experiments, described in the *Comptes rendus de la Soc. de Biologie*, in order to throw light on the mechanism of the inhibitory action exercised by the testicle on experimental glandular hermaphroditism. It has previously been shown that if ovarian grafts are made in an intact male guinea-pig no enlargement of the breasts occurs, the effect of the grafts being inhibited by the action of the testes. Lipschütz and Voss have, however, now found that if previous to the grafting the lower pole of the epididymis be removed so as to convert the testicles into fragments having no connexion with their excretory ducts, the inhibiting action of the testicles is prevented, with the result that the ovarian transplantation produces a marked development of the breasts. This at first sight would suggest that the inhibiting action exerted by the testicles on the ovarian grafts depends on spermatogenesis rather than on the interstitial cells. The experiments, therefore, as far as they go, are in harmony with the view that is held by many investigators, that the hormonal function of the testes is not entirely centred in the interstitial cells. The epididymectomy carried out by Lipschütz and Voss is similar in its effect on spermatogenesis to ligature of the vas. It must, however, always be borne in mind that regression in the tubules does not occur immediately after ligature or epididymectomy, but only after an interval has occurred. Intact tubules, as Mr. Kenneth Walker pointed out in an article published in THE LANCET of Feb. 2nd, are found in the human subject as long as three months after vasotomy. Care must, therefore, be exercised in interpreting Lipschütz's experiments as a proof that the inhibitory action exercised by the testicle on an ovarian graft is entirely dependent on the existence of spermatogenesis.

SCHISTOSOMIASIS.

THE scattered literature on the subject of the schistosomiasis of the Far East, the disease produced by the trematode, *Schistosoma japonicum*, has been collected and coördinated by Drs. E. C. Faust and H. E. Meleney in the Monographic Series of the *American Journal of Hygiene* (No. 3, March, 1924), where they have supplemented and embellished our knowledge of the fascinating subject with a considerable amount of original work. This monograph consists of some 339 pages with a comprehensive index, and is abundantly illustrated with drawings and microphotographs. There is included an appreciation of the historical aspect of the schistosomiasis problems which was badly needed, and in this survey the fine work of the earlier Japanese investigators is given due credit. Other sections deal with the morphology, biology, and life-history of *S. japonicum*, its development with the molluscan host, the cercaria stage of the fluke, its development within the definite host—all the stages being well depicted by means of accurate comparative outline drawings and photographs. The migration of the fluke in the human body, the pathological anatomy of the disease, the clinical and therapeutical aspects are all passed under review, while the portions dealing with the biology of the intermediate hosts, the geographical distribution of the disease, and the question of its efficient prophylaxis are all welcome. The monograph contains two important appendices. The first, a zoological study of the molluscan hosts of *S. japonicum*, is from the pen of the late Dr. Nelson Annandale, F.R.S. elect, and must have been completed shortly before his death. Emanating from such a source, and from the zoological survey of India and the Indian Museum, Calcutta, this contribution is quite authoritative. The accurate description of the snails is illustrated with some fine illustrations of their morphology, and from this it appears that the correct nomenclature of the intermediate hosts is *Oncomelania*, Gredler (1881), of which there are three species—*nosophora*, *formosana*, and *hupensis*—which act as intermediaries in various parts of the Far East. The genus *Blanfordia* is now known to be quite distinct. The other appendix contains a full bibliography historically arranged.

GOITRE IN BRITISH COLUMBIA.

GOITRE affecting animals in British Columbia has a seasonal incidence, being more prevalent in late winter and early spring when the fresh green food of summer is not available. An article by Dr. W. D. Keith, of Vancouver, in the April issue of the *Canadian Medical Association Journal*, draws this and other interesting conclusions from his own personal observations. The incidence of goitre in the valley which he studied has disappeared entirely following on the use of iodine. Sanitation appears to play little part, for in the Indian Reserve, where conditions seem most favourable for spread of contagion, no goitre was found either among live-stock or human beings. But goitre was endemic in the Pemberton Meadows, inhabited only by white men during the last 30 or 40 years on a virgin soil with remarkably pure water-supply. Certainly, the iodine-deficiency theory of goitre is strongly supported by the evidence which Dr. Keith brings forward. There may be other factors. In a recent British Medical Association lecture [1] Dr. R. McCarrison still lays special stress on one of these—namely, the continued infection of the bowel by way of polluted water. But wherever goitre arises in the absence of bowel hygiene, Colonel McCarrison would now assume insufficiency of intake of iodine in food and water. The method of prevention of goitre by iodine, he states, is at once simple, rational, cheap, and devoid of ill consequences.

THE ULTIMATE RESULTS OF RADICAL OPERATIONS FOR MIDDLE-EAR DISEASE.

IT is a disappointing feature of radical operations for middle-ear disease that they so often leave a serous or purulent discharge which, though it may not be a serious danger, is, at any rate, a blemish and a social hindrance. The causes of this sequel are various; it may be that the operation has not been radical enough, some of the diseased bone having been left behind, or, as happens frequently, the operator has not succeeded in providing the cavum tympani with an epithelial lining suited to its modified functions. Yet another important cause of a persistent discharge is neglect of after-care, of that periodic supervision which patients should enjoy for at least a year after a radical operation. It is this lesson in particular that Dr. P. Henius and Dr. H. I. Schousboe emphasise in the last number of *Acta Oto-Laryngologica* (1924, vi., fasc. 1 and 2). In the autumn of 1922 they investigated the fate of the 301 patients on whom

[1] Brit. Med. Jour., June 7th, p. 989.

a radical operation for middle-ear disease had been performed in the period 1901–20 in a Danish hospital. In 19 of these cases the operation was performed on both sides, and in 65 cases cholesteatomata were found. Of the 13 patients who died in hospital, as many as 12 showed intracranial complications before the operation. Among the 288 patients who left hospital alive, there were 234 about whom information was obtained in 1922. Eleven were found to have died, but in no case was the cause of death connected with the operation. Of the 135 patients who submitted to a re-examination in hospital, 15 had been operated on for middle-ear disease on both sides. There were thus 150 operation results to check, and only in 67, or 45 per cent., was the operation wound found to have healed completely. Among the remaining 83 cases of imperfect healing, a mucous discharge from the Eustachian tube or from the imperfectly healed cavum tympani was the most common defect. In other cases there was a comparatively profuse and often purulent discharge from the cavum tympani or other parts of the field of operation where granulation tissue and, at a few points, denuded bone were found. Some of the worst cases, from the point of view of healing, were also the worst cases from the point of view of elementary cleanliness on the part of patients whose indifference and inertia were mainly responsible for the accumulation of wax and epithelial debris. In many cases a short course of after-treatment effected complete healing of the operation wound, and the authors insist that it would be well if every patient undergoing a radical operation for middle-ear disease were to be instructed to report periodically, say once or twice a year, for supervision, and, if necessary, a short course of after-treatment.

A JOURNAL OF INFECTIOUS DISEASES.

Prof. R. Kraus, of Vienna, is editing a new journal, with the title of *Seuchenbekämpfung*,[1] which has as its object to keep the general practitioner and veterinary surgeon in contact with recent developments of experimental medicine, especially in its application to infectious diseases, such as vaccine therapy, chemotherapy, protein therapy, and new methods of prophylaxis. The literature on this subject is so vast, so difficult to appreciate critically by the non-expert, frequently so contradictory, that the general practitioner may well be excused if he lets his innate conservatism get the better of him. The aim is to present positive achievements which are ripe for application in general practice in the form of brief and clearly written articles by authorities of standing. The first number opens with an article of ten pages by Dr. J. Gerstmann, on the Malarial Treatment of General Paralysis. Details of the treatment are given and the conclusion is reached that "the dogma of the incurability of this disease has been overthrown." This is followed by a paper from Prof. Pirquet's clinic, on the present state of diphtheria prophylaxis. Prof. Przibram has a paper on the diagnosis and ætiological treatment of bacillary dysentery. Prof. Kraus writes in favour of the curative and prophylactic value of anti-tetanus serum. Other papers in this number deal with the technique of the production of antitoxic sera, the technique of collecting specimens for bacteriological and serological examination, the experimental production of cancer by tar, the animal epidemics in Jugoslavia, and the methods employed in fighting them. The last paper is a short note by Prof. Kraus dealing with certain ill-effects encountered in immunising sheep against anthrax. The papers are clearly written, and if the standard set by this first number can be maintained the journal will certainly be a useful addition to current medical literature. It was apparently conceived by Prof. Richard Paltauf, whose death, recently recorded by our Vienna correspondent, removes one of the last surviving pioneers of bacteriology and serology. His labours, which were devoted particularly to the application of bacteriological discoveries and methods to practical medicine, have gained for him a distinguished place in one of the most remarkable periods in the history of medicine.

[1] Verlagsbuchhandlung M. Perles, Wien I., Seilergasse 9. A double number two-monthly. Subs. 4 Swiss francs a year.

AN OVERCROWDED MENTAL HOSPITAL.

THE impression that certifiable mental disorder in Ireland is increasing is confirmed by the annual report (for 1922) of the Ballinasloe Mental Hospital, which has just reached us. Here the number of patients increased in the course of the year by 49 to a total of nearly 1500, although the medical staff consists of three members only. The inspector's report opens with the sentence, "This mental hospital is greatly overcrowded." Apparently the dormitories being full of beds, corridors are also being used as sleeping apartments. This report contains other serious criticisms; food and clothing were of bad quality, the grounds were not well kept; "the attendants' rooms were not in a proper state of order and cleanliness"; the women's exercise grounds were entirely inadequate; more patients could have been usefully employed, some of those who were working had been hired out to farmers, "a practice objectionable on more than one ground." Two suicides and two fatal and many non-fatal accidents are recorded; various infectious diseases, including typhoid, have been prevalent; the deaths from tuberculosis numbered 14. No mention is made of therapeutics. It is to be feared that the bad conditions reflected in this report are only too common in Irish asylums, and are due directly or indirectly to financial difficulties. The efforts of the staff might be expected to produce certain improvements, but initiative may well be discouraged by the impoverished aspect of the inadequate buildings in which they work.

RAT-BITE FEVER.

Dr. Paul A. O'Leary,[1] associate in the Section on Dermatology and Syphilology of the Mayo Clinic, states that since rat-bite fever was first described by Millot-Carpentier in 1884 about 140 cases have been recorded. The disease has occurred in all parts of the world, but is naturally most prevalent in those countries where rats are numerous, such as Japan, England, France, and the United States. In 1915 Futaki described, under the name of *Spirochæta morsus muris*, an organism which he had recovered from rats and from patients suffering from rat-bite fever, and therefore regarded as the cause of the disease. Hitherto, however, only Japanese observers have succeeded in isolating this organism in cases of rat-bite fever in man, and other organisms have been regarded as of ætiological importance, such as a streptothrix, by Tileston, Schottmüller and Blake, a sporozoön by Ogata, and a diplococcus by Douglas, Colebrook, and Fleming.[2] Dr. O'Leary, who records two illustrative cases, pays special attention to the dermatological manifestations of the disease, which he classifies under the headings of roseola, indurated erythematous plaques, lesions of the mucous membranes, and alopecia. The roseola consists of large reddish-blue or purple macules scattered diffusely over the lower extremities, neck, and face, in contrast with the roseola of syphilis which is more pronounced on the trunk. The macular lesions usually appear with the first attack of fever and rapidly undergo involution, leaving brown pigmented patches which may remain for several weeks, but do not usually persist throughout the disease. The most characteristic lesion of rat-bite fever is the indurated bluish-red or livid plaque with a lighter coloured concentric zone just within the margin. The lesions are widely disseminated and vary in size. The larger plaques are, as a rule, definitely indurated, and may be surrounded by smaller non-indurated macules. With each exacerbation of fever the older or fading lesions become more distinct, and

[1] Archives of Dermatology and Syphilology, 1924, ix., 293.
[2] THE LANCET, 1918, i., 253.

new lesions may appear, subsiding in their turn with the fall of temperature. Œdema of the skin is sometimes a prominent feature, its extent depending on the situation of the indurated lesions. Coarse, flaky desquamation follows the involution of the erythematous plaques. The skin lesions become less numerous and distinct as the disease progresses, and disappear altogether as it subsides spontaneously or is arrested by intravenous injection of neo-arsphenamin, as occurred in one of Dr. O'Leary's cases.

DR. EDMUND SMITH'S RETIREMENT.

HIS colleagues in the public health service will have learned with regret of the impending retirement through ill-health of Dr. Edmund Smith, medical officer of health for the city of York. Dr. Smith was York's first whole-time medical officer, and the quarter of a century during which he has held office has been a time of great progress in public health matters. During his first year there was an extensive epidemic of typhoid fever in York, which led to the gradual abolition of the conservancy system and the improvement of the sewers. Voluntary notification of pulmonary tuberculosis was adopted at an early date, and a complete scheme for dealing with tuberculosis has since been built up. An excellent maternity and child welfare scheme has come into being as the result of whole-hearted coöperation with the York Infants' Welfare Association. In his report for 1922 Dr. Smith told of the opening of the new maternity hospital at Acomb Hall, a building admirably adapted for the purpose with accommodation for some 40 patients. One of the principal features of public health work in York has been the happy blending of municipal and voluntary effort, in no small degree due to the tact and enthusiasm of the medical officer of health. Comparison between the death-rates in the year of Dr. Smith's appointment (1900) and the last year for which figures are available (1923) shows that the general death-rate has fallen from 20·3 to 10·3; the tuberculosis death-rate from 2·10 to 0·86; the infant mortality-rate from 211 to 51. We are not surprised to learn that the cause of Dr. Smith's retirement has aroused deep sympathy on the part of the citizens whom he has served so faithfully.

WE regret that by an oversight the name of Surgeon Rear-Admiral Charles Marsh Beadnell was omitted from the list of Birthday Honours in our issue of June 7th. Admiral Beadnell received the C.B., Military Division.

THE annual dinner of the Federation of Medical and Allied Services on June 20th will be held in the Crown Room at the Connaught Rooms, Great Queen-street, W.C. This alteration of place has now become necessary owing to the applications for tickets having greatly exceeded the accommodation available at the Langham Hotel.

Dr. Arthur Hurst will deliver the Savill (Memorial) Lecture at the house of the Royal Society of Medicine, 1, Wimpole-street, W., on Thursday, July 3rd, at 5 P.M. Dr. Hurst has chosen Migraine as his subject, and the chair will be taken by Sir William Hale-White, President of the Royal Society of Medicine. These lectures were founded in connexion with the West End Hospital for Nervous Diseases. Any member of the medical profession will be admitted on presentation of his card.

AT a meeting of the Board of Governors of the McGill University, Montreal, on Thursday, June 5th, it was announced that the sum of half a million dollars had been granted by the Rockefeller Foundation to the Medical Faculty of the University for the establishment of a university medical clinic in coöperation with the Royal Victoria Hospital. We also learn that Dr. J. C. Meakins, Christison professor of therapeutics at the University of Edinburgh, has been appointed director of the clinic.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

LXXV.

TREATMENT OF ACUTE GONORRHŒA IN THE MALE.*

GONORRHŒA in the male has an incubation period of 3–21 days; the average is 5, any time after 10 is rare. The earliest symptom is a slight gumminess of the meatus, associated with a sense of chafing. This appears usually on the second day after contact, and, if a smear is then taken, gonococci are present. This is an important fact not generally known, most practitioners waiting until pus shows on the third to fifth day. The inflammation at this stage is still confined to the squamous epithelium of the fossa navicularis, where the gonococcus can lead only a precarious life. It has not yet spread to the columnar epithelium of the urethra proper, where the organism can speedily burrow between the cells, invade the racemose glands of Littré, and establish itself firmly. The importance of recognising the gonococcus thus early, and before pus formation, is due to the fact that at this stage it is still possible occasionally to abort an attack.

Abortive Treatment.

The most successful method is that of Ballenger. After the patient has urinated, the glans and meatus are cleaned with spirit, and 20 minims of 1 per cent. protargol, or 1/2000 collosol silver, is instilled into the anterior urethra with an ordinary hypodermic syringe. The lips of the meatus are then closed, and sealed with a strand of cotton-wool soaked in collodion flexile. The penis is then held erect until the seal has dried. After three hours this seal is removed with acetone, the patient meanwhile having been instructed to drink 1½ litres of Contrexéville or barley water. The same manœuvres are repeated six hours later, and, if pus formation has not started, continued on the two succeeding days. The method probably acts by increasing osmosis. Its success can scarcely be due to the strength of the gonococcicide used. In private practice a small proportion of first-attack cases can be aborted in this way, and it is therefore worth the attempt, particularly in married patients. In hospital cases it seldom succeeds. Carelessly used it aggravates the attack, especially in relapse cases. The points to remember are: (1) Not to use more than 20 minims—the normal capacity of the urethra. (2) Not to use silver nitrate, as is often done—it is a dangerous drug to seal up. (3) Never to attempt the method if pus is actually present—damming up the discharge in this way only aggravates the condition.

Treatment of an Established Case.

When definite pus develops, the patient should be given a saline purge, and the bowels regulated throughout the attack. This appreciably diminishes the chance of posterior spread. A suspensory bandage should be worn, and the penis carried in a bag containing medicated cotton-wool to catch the discharge. Riding, cycling, dancing should be interdicted, all alcohol prohibited, spicy foods and coffee deleted from the diet. Urinary antiseptics are of no value in the acute stage of the disease. Sod. bicarb., gr. xx. quartis horis, to reduce acidity, may be required if micturition is painful. Bromides by the mouth and suppositories of atropine, gr. 1/75, should be prescribed if painful erections occur.

The purulent discharge is attacked in three ways: (1) by chemotherapy, (2) by vaccines, (3) by irrigations.

* An article in this series on Acute Gonorrhœa in the Female will appear in the next issue of THE LANCET.

Chemotherapy.—Here the drug *par excellence* is manganese butyrate. It should be given by intramuscular injection into the buttocks on the first and fifth day of the discharge, in doses of 1·0 c.cm. and 1·5 c.cm. of a 1 per cent. solution. Extremely gratifying results follow its use, the acute stage of the disease being materially lessened. Only two injections should be given—a third aggravates the condition.

Vaccines.—These are of great value in the acute stage of the disease, and in my experience clinical evidence is overwhelmingly in favour of vaccines of the non-toxic variety. The Lock Hospital vaccine is prepared in a strength of ten thousand million to the c.cm. It can be given every five days. The initial dose is 0·25 c.cm., increasing to 0·5, 0·75, 1·0 c.cm., and continuing at 1·0 c.cm. whilst required. A negative phase does not appear to be produced, and complications such as epididymitis are rarely seen if this form of therapy is used.

Irrigation.—This plays an important, but subsidiary, part in the treatment of the disease. If the urethra were a simple tube without glands it would be an easy matter to devise some wash-out method which would speedily cure the condition. Unfortunately Nature does not work in this way, and, by the time the discharge is in evidence, the gonococcus has already penetrated below the surface of the mucous membrane, invaded the glands of Littré, and entrenched itself well beyond the reach of any antiseptic that the urethra will tolerate in a strength sufficient to penetrate. Failure to recognise this fact, and persistence in using irrigation to the point of irritation, is responsible for many of the prolonged cases of urethral discharge which are so common in every clinic to-day. Irrigation should be used mainly for the mechanical purpose of washing out accumulations of pus. It is the increase in antibodies produced by the natural reaction of the body, and augmented by the use of vaccines, which causes the condition to clear up. Many drugs have been used for the purposes of irrigation. Practical experience speedily reduces the list to some five or six. These include: permanganate of potash 1/8000 to 1/4000, zinc permanganate 1/8000 to 1/4000, oxycyanide of mercury 1/6000 to 1/3000, acriflavine 1/4000 to 1/2000, silver nitrate 1/12000 to 1/6000. Each of the drugs enumerated has certain advantages. Permanganate of potash is the more generally useful. Zinc permanganate is valuable when an astringent action is required in the resolving stages, when the mucus output of the glands of Littré needs checking. Oxycyanide of mercury is valuable when the urine becomes clear with threads, in mild recurrences, and in cases where secondary organisms are more prominent than the gonococcus in the discharge. It should never be used if the patient is taking iodide of potash by the mouth, as intense strangury is caused by the combination in the urine. Acriflavine is very useful in early cases when the urethra is particularly irritable and permanganate of potash cannot be tolerated. It tends, however, to make the mucous membrane very sodden, and should therefore be alternated with zinc permanganate every three days. Indeed, it is a useful practice to ring the changes on whatever drugs are being used. Silver nitrate has its chief value in the later stages when a posterior urethritis is clearing up too slowly.

All irrigations should be given at least once a day at first, and then at gradually increasing intervals as the urine clears up. The temperature of the lotion should be 105° F., and the height of the irrigator about 2 feet above the patient's urethra. Two litres is the usual amount required. A syringe should not be recommended unless irrigation is impracticable. If it must be used, it is required three or four times a day, should be given in the erect posture, and the greatest possible care taken not to force the sphincter.

The question whether the anterior urethra *only* should be washed out at first, or the bladder irrigated right from the start is still a disputed one. Logical treatment suggests anterior irrigation only for the first week, and if no signs of posterior implication then show, the continuance of this procedure. Sixty per cent. of cases are said to develop posterior urethritis within the first three weeks. This I think is much too high an estimate. It certainly does not occur to that extent in the manganese-vaccine cases. Posterior urethritis is indicated in acute cases by frequency, precipitancy, pain, temperature, and usually a decrease in the discharge with some hæmaturia. Such a syndrome cannot be missed; but, unfortunately, in some 50 per cent. of cases the patient complains of nothing more than a little frequency. It is for this reason that many competent urologists recommend bladder lavage from the start; and although I do not recommend this, I must admit that in my experience there does not appear to be any extra risk involved in the procedure, provided that the anterior urethra has been thoroughly irrigated beforehand to get rid of all visible discharge. To irrigate the bladder the reservoir should be 5 feet above the urethra, and the patient instructed to urinate against the pressure of the incoming fluid. With a little practice it will then be found that the sphincter can be taught to relax automatically.

Acute Posterior Urethritis.

Symptoms of acute posterior urethritis should be treated, if possible, in bed; irrigations stopped, hot sitz baths prescribed, and the urine rendered alkaline with sod. bicarb., gr. xx. quartis horis. Suppositories of atropine gr. 1/75 should be given to prevent extension to the epididymis. Only after the condition becomes quiescent should irrigation be resumed. When discharge is lessening down the prostate should be examined per rectum; but massage is not indicated in the inflammatory stage. If the prostate is painful and a little swollen to the touch, manganese butyrate, if not already given, should be tried in a dosage of 1 c.cm. intramuscularly. If, unfortunately, abscess development occurs, it is bad practice to pass a sound in the hope of rupturing it into the posterior urethra—an intractable posterior urethritis generally follows. If it is found pointing towards the rectum, resist the temptation to incise—you will only add a coli infection to the already existing gonococcal one, and may also establish a fistula. The correct procedure is to make a transverse incision in the perineum and drain. Epididymitis quickly resolves under intramuscular injections of contramine 0·25 g., and 10 per cent. guaiacol ointment locally.

Whilst under treatment the urine should be inspected at every visit to gauge the progress of the case. The simplest routine method is Thompson's two-glass test. In this the patient passes his urine into two glasses, one or both of which will show pus whilst discharge is present. As long as the second glass is clear the posterior urethra is probably not involved.

Instrumentation.

When both are clear, with or without threads, the acute stage is over. It is when this stage has been reached, and not till then, that intra-urethral instrumentation is permissible. Diagnostic bougies, sounds, dilators, the urethroscope are all contra-indicated as long as the urine is muddy with pus or muco-pus. Enormous harm has been done in recent years by over-instrumentation, and invaluable instruments such as the urethroscope discredited in consequence.

The Standard of Cure.

No standard of cure in the male is complete that does not include a complete endoscopic examination of the urethra, the passage of a full-sized sound, and the microscopic and cultural examination of the urine before and after prostatic massage on several occasions spread over some months. A large proportion of so-called second and third attacks are merely relapses from a first attack of gonorrhœa that has never been adequately treated because never properly examined for cure.

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Special Articles.

A REVIEW OF THE PRESENT POSITION OF THERAPEUTIC IMMUNISATION.

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VACCINE therapy, the attempt to treat active disease by the subcutaneous injection of killed cultures of the causal micro-organism, has now been before the medical profession for a very considerable period. It has been tried in almost every conceivable malady in one form or another, and in many conditions but for many observers judgment is still suspended as to its actual value. A like phase has existed for a whole host of therapeutic agents, and in recalling these forgotten pages of their history the cynic may find some gloomy satisfaction in noting how repeatedly the final judgment has allowed to them but little utility, or utility in only a very restricted sphere. To-day it is to speak with great moderation to say that the hopes and expectations of the earlier days of vaccine therapy have not been realised. Fundamentally, the doctrine lying behind this mode of treatment has depended upon the specificity of micro-organisms as the causal agents of disease; and in practice this belief in specificity has been pushed to the extent of insistence upon autogenous vaccines in the belief that, for example, the gonococcus from one person's urethra in some subtle way differs from the gonococcus in a second person's and that the autogenous strain is accordingly preferable from an antigenic point of view. This belief, let it be said, does not always rest upon any sound experimental basis. Clinical experience has thrown doubts upon some of these fundamental conceptions. It has been a recurring experience that stock vaccines sometimes give as good, and in many cases an even better, result where good results follow upon vaccine treatment than the autogenous variety and, in fact, that there is in the whole matter an element of uncertainty, difficult to explain if the guiding theory be correct, which makes each application of vaccine therapy an experiment in itself.

Other facts, brought forward from time to time, raise more serious doubts in the minds of their users as to the mode of action of vaccines, and call into direct question the correctness of the theory upon which their employment has been based. Amongst these we may cite the abundantly good results reported from the use of substances derived from organisms by their chemical treatment: partial vaccines, detoxicated vaccines, and residual vaccines, as they are called by their various advocates. These are for the most part prepared by dissolving the bacterial bodies and precipitating a majority of the protein from the solution by means of some protein precipitant. Such substances are said to have antigenic properties and to produce good results in the conditions in which they have been employed. With the benefits obtained we are not immediately concerned, but, if the facts are as stated, they direct a serious blow at the doctrine of specificity and would seem to dispose altogether of the ideas underlying the advocacy of autogenous vaccines. Yet more, repeated accounts are met with in which credit is attributed to vaccines, which are avowedly and altogether non-specific in their action—a vaccine prepared from one organism being productive of good results in conditions definitely due to another. In view of the growing accumulation of fresh facts, directing light upon one or other facet of this many-sided problem, it seems well to summarise and re-survey the whole question in an endeavour to arrive at the present position of knowledge in this field. Within the last few years certain fresh ideas have been put forward which make this all the more necessary, since they introduce conceptions radically different from those which have been so firmly established for a number of years.

The History of Artificial Immunisation.

To go back over the history of artificial immunisation we begin with Jennerian vaccination as the first really successful production of immunity by a modified virus; it is a preventive method, and one which goes out to meet, half-way, the previously practised inoculation. Pasteur's work, from the point of view of the present problems, concerned itself with anthrax, fowl cholera, and rabies, and was in each case directed towards prophylaxis. It adhered to the earlier work of Jenner in the very important principle of producing immunity in the *uninfected subject* by means of a known and living virus, but one attenuated beyond that degree of virulence which is capable of initiating the actual disease. This method, which as far as we can see most closely approximates to the means productive of the most solid variety of immunity known, recovery from the actual disease, is therefore the one which of all possible methods is most likely to convey a substantial degree of resistance to subsequently encountered infection. The step from these procedures to vaccination by means of killed cultures is therefore a very great one. In the new field, which although entered earlier by several investigators, is especially the domain of Sir Almroth Wright, and in which the most prominent investigations have been the delicate in vitro experiments which are peculiarly his own, the application of the principles which this method contains has been widely made with varying degrees of success. Success has been most pronounced in the case of preventive inoculation, notably against typhoid fever, where it has been unequivocal. In another field, however, that of vaccine therapy properly so-called, the attempt not to prevent but to treat the disease in an infected subject, there is an even further departure from the underlying ideas of the Pasteurian method, and here the results obtained have been very uneven and often disappointing. Much water has run under many bridges since the first introduction of vaccine therapy, and in the interval an immense amount of work has been expended in the endeavour to elucidate the mechanism of bodily immunity. This work has given us, in the form of a by-product, certain diagnostic tests of the greatest value in clinical medicine, such as the Widal and Wassermann tests, but there has been little real accretion to our knowledge of the principles of resistance and immunity from the results of workers in this field. Recently certain fresh ideas, bearing upon this problem and consequently upon that of its artificial stimulation, have been put forward which are suggestive.

Tissue Immunity.

One of these is the conception of "tissue immunity," which has been especially brought into prominence by the labours of Besredka, and has received a good deal of indirect support from various sources. As the outcome of experiments upon mouse infections with typhoid Besredka concluded that the only really effective way of achieving immunity in such animals is by bringing the organisms into actual and intimate contact with the normal seat of infection, the alimentary mucous membranes, and that whilst subcutaneous injections gave an extremely mediocre degree of resistance a sublethal infection by the alimentary tract gave a substantial and lasting one. It will be seen that these ideas carry us back very close to the principles of Pasteurian vaccination, which have been in some danger of being lost sight of. This hypothesis has been developed in two directions. Firstly, in practice, a method of prophylactic inoculations has been involved in which the vaccines are administered by the mouth, with special precautions to ensure as far as possible an intimate contact between them and the mucosal cells; a method which it is claimed is applicable to the prevention

of diseases of intestinal origin. The procedure is as yet on its trial, but encouraging reports are appearing from France, and Ch. Nicolle, in a few concise experiments, appears to have demonstrated its efficacy in affording protection against dysentery in the human subject. Here, indeed, if its success is proved its greatest sphere of utility should lie, since the violent reactions which the subcutaneous injection of dysentery bacilli occasion practically prohibit inoculation by this route. In the second place, Besredka's work lends support to the theory that in disease immunity is often a special function of a particular tissue rather than one implicating the body cells generally, as we have been perhaps too prone to think, and hence, in the production of artificial immunity, we should proceed in accordance with this principle. In other words, that since certain diseases produce their most striking lesions in given tissues the process of artificial immunisation should be directed towards that tissue and the immunising agent introduced into it, in the case of typhoidal disease into the intestine and its mucosa, in the case of anthrax into the skin; a principle which appears to have long been practised, albeit unwittingly, in the case of vaccination against small-pox. Some direct support for this suggestion comes from the results of experiments upon anthrax, which have shown that the guinea-pig, an animal commonly regarded as very susceptible to this disease, is in reality relatively insusceptible provided that the organisms are introduced into the deeper tissues and infection of the skin is avoided. In accordance with this finding attempts to immunise by sub-cutaneous injection, even when pursued with the greatest care and persistence, confer, in the case of these animals, only a slight resistance to the infection, but if graduated intradermal inoculations be made a very substantial immunity can be established. This contention of the autonomy of different tissues in regard to disease, and the possibility of the production of local immunity at the site of normal invasion, is an engaging one. Levaditi's experimental work upon encephalitis, herpes, and allied conditions, and Marie's experiments upon vaccinia have tended towards the same conclusions, and in certain cases may extend them to embrace structures related by development from the same embryonic layer. In passing, one may note that the single affection in which it is most generally agreed that the subcutaneous injection of vaccines is most often beneficial, furunculosis, is an integumentary one.

Stimulation of Specific Means of Defence by Non-specific Substances.

Whilst these results may go to show that we have been too readily satisfied with subcutaneous injections in our attempts at therapeusis by vaccines, and to demand a reconsideration of route as well as of type of substance introduced, other work has been going forward which is of special interest in relation to both of these matters and particularly in pointing to the possibilities of the production and provocation of non-specific means of defence. One must readily realise that, from the point of view of bacterial infections, the body is provided with both specific and non-specific, or general, means of defence. Phagocytosis is essentially non-specific: available against the majority of bacterial invaders. The more complex serological reactions are essentially specific: developed only in response to the presence of individual types of organisms. It is to be remembered that these latter are only demonstrated by such techniques as we possess, and we have no knowledge as to whether it is an enormous or a relatively slight concentration which can be revealed by the methods available. It is quite possible that many of these antibodies may be normally present but in insufficient concentration to be shown by the means we can dispose. Although most of the serological reactions are, as we see them, essentially specific, it must not be forgotten that non-specific means of defence most certainly exist in the body fluids and that we have perhaps been led, by the attractiveness of the opsonic theories and the usefulness of the serum tests, rather to lose sight of these means of defence and to forget the possibility of stimulating them by other ways than by vaccines derived from the causal organisms. There are, therefore, two possibilities to be considered. One is the stimulation of the specific means of defence by non-specific substances; the second is the stimulation of more generally applicable, non-specific, protective substances and the methods of doing this. With regard to the first case, striking evidence of its possibilities has been brought forward by Walbum and Mörch in Madsen's laboratory. It has been found that the intravenous injection of manganese chloride provokes, in horses used for the production of diphtheria antitoxin, a marked augmentation in the amount of this substance in the blood; this takes place within a few hours of the injection; similar experiments upon the production of agglutinins have given results of a like nature. It is perhaps significant to recall at this juncture the present widespread use of colloidal manganese in the treatment of localised septic foci.

Stimulation of Non-Specific Protective Substances.

In connexion with the second of the two therapeutic possibilities enumerated above, some very striking results recently obtained by Sir Almroth Wright call for attention. Wright has found that the addition of a culture of organism to blood, outside the body, causes a liberation of anti-substances, occurring rapidly and at once, which results in the blood becoming highly bactericidal. Following out these observations, it has been further found that the same phenomenon takes place where the vaccine, in appropriate dose, is injected into the blood-stream of a living animal or man. The result is a sudden increase in the bactericidal power of the blood, which is general in nature and effective for other species besides that of the organism used in making the injection. There is here, therefore, a reaction of a type quite different from those with which the serologist usually works. It is no question of a slow development of agglutinins, complement-fixing bodies, or the like, in response to a specific infection, but a rapid and immediate outpouring of bactericidal substances available for the destruction of a number of bacterial species. Wright holds that these substances are derived from the leucocytes, a source of origin for all humoral anti-substances invoked by Metchnikoff many years ago; and it may be relevant to recall here the marked effects produced upon the leucocytes by injection of peptones and a variety of other substances, as well as the maximum degree of the same phenomenon which is seen in shock associated with intravenous injections in anaphylaxis. This line of thought may link up these phenomena with the striking results claimed from time to time, especially during the war, for intravenous injections of eusol, alkalies, and other substances, in desperate cases of sepsis, and to suggest that these bodies produce their beneficial results not by any direct action upon the bacteria but by their action upon the leucocytes.

Non-Specific Protein Therapy.

Non-specific protein therapy, which has its vogue in therapeutics, is probably another example of the same phenomenon. These varied observations may seem on casual inspection to be isolated and unconnected, but to the writer it seems that there is a general underlying idea running through them all, and that the mechanism of bodily defence and recovery is in process of being made more plain by such various investigations which from different sides are converging upon the same central idea. They are nearly all as yet in the tentative stage, and require a great deal of further development and classification, but they are tending towards knowledge and towards the ultimate removal of the easy reproach, from which the vaccine user cannot yet escape, of "injecting a substance, of which you know little, into a body of which you know less."

HEALTH OF THE NAVY IN 1921.[1]

EIGHTEEN months ago, when we examined the last of these reports,[2] that for 1915, we hoped soon to see that for 1916. Now, 18 months later, we get the report for 1921, and notice that the Admiralty has decided to cancel the preparation of reports for the years 1916–20. This regrettable decision interrupts a series which, completed by the volumes to 1929, would have been continuously published for 100 years; moreover, there are reasons why the decision is particularly unfortunate at this time. The price of the Blue-book has fallen a little; the last cost 7*s.* 6*d.*, this, though slightly larger, costs 6*s.* 6*d.*; smaller type for the tables might still further economise space and paper. The interesting comments on the occurrence of diseases from the reports of medical officers are cut down drastically this year; the statistics have been rearranged in accordance with the 1918 nomenclature of diseases; cases of syphilis are now classed as "first" or "second record," and pneumonia is named "pneumococcal infection (lungs)," and gonorrhœa becomes "gonococcal infection, acute." The "total force" employed and reported upon had fallen from 236,500 in 1915 to 110,700 in 1921. Wounds received in action were 15, eleven among the marines in Ireland, the other four in the Yang-Tse River; 57 men were lost in the distressing disaster to submarine K5.

For every 1000 men employed there were 583 cases of disease or injury (91 of them injuries), with 23·2 invalidings and 3·58 deaths. Venereal disease has greatly increased both in number of cases (113 against 67) and duration of each case (26 days against 14). There is also greater loss of service this year from influenza (31 cases per 1000 men), malaria, Mediterranean fever, and scabies. About the same are the infectious fevers, tubercle, diseases of the eye, ear, and nervous system (though there are only half the cases of insanity that occurred in 1915, during the war), while meningococcus infection has almost disappeared, and enteric fevers, pneumonia, rheumatic fever, and diseases of the digestive system (tonsillitis is one), and of the skin are all materially less. On the whole, a very considerable reduction of the number of cases of illness in the Navy, apart from venereal disease, since 1915. The "sick daily" figure has risen from 22 to 25 for every 1000 men, but if venereal cases are in each year deducted, there is really a fall, from 19 to 17. In other words, the sickness for which medical officers are responsible has considerably decreased.

Invalidity in Various Groups.

The naval forces as arranged in the tables fall naturally into three great groups, the fleet at home, the Atlantic Fleet (29,050 men); the Fleets Abroad (26,950); and the Home Station (54,700), which, with some ships, includes also the depôts and the training establishments. These all together constitute the "total force" (110,700 men), from which are still excluded for no obvious reason the 5480 men at Marine Headquarters, whose particulars of illness are given in two separate and not entirely consistent tables on pp. 174 et seq. and p. 188.

In the great groups mentioned the highest proportion of loss of service by illness is shown by the fleets abroad, which suffer more than the others from venereal disease and injuries, while the healthiest is the Atlantic Fleet, with less than half the complement coming on the sick-list during the year, and an average loss of service of 6·8 days per man. The most important health statistics of these groups can be seen in the accompanying table, though it must be remembered that all the sick-rates are merely crude sick-rates, with no standardisation for ages.

[1] Statistical Report on the Health of the Navy for 1921. London: H.M. Stationery Office. 1924. 6*s.* 6*d.*

[2] THE LANCET, 1922, ii., 1032.

Health Statistics in the Groups.

—	Training estab.	Atlantic fleet.	Fleets abroad	Home station	Total force.	Marines at H.Q.
Number in group.	3637	29,050	26,950	54,700	110,700	5480
Wounded or killed in action	—	0·03	0·28	0·34	0·24	2·18
Other injuries	100	86·9	112	82	91	141
Venereal disease	†	107	179	81	113	52
Other diseases	1200	290	427	404	379	459
Total cases (Disease and injury)	1299	483	720	569	583	653
Invalided ..	61	17·9	28	32	23	45
Dead	6	4	4·4	2·9	3·6	1·6
Sick daily ..	77	18·6	29·9	27	25	21
Loss of service per man in days	14·7	6·8	10·9	9·9	9·6	7·9
Loss of service, less venereal disease ..	—	4·6	6·6	7·2	6·7	6·5
Individual Diseases.						
Enteric fevers	—	0·27	1·6	0·32	0·6	0·2
Influenza ..	—	35	35	27	31	6·7
Pneumococcal infection (lungs) ..	12·3	1·4	1·8	3·7	2·7	4·5
Rheumatic fever	18·4	1·7	2·3	2·5	2·3	3·8
Tuberculosis ..	—	2·3	2·3	2·4	2·4	3·6
Appendicitis ..	—	3·3	3·7	3·6	3·6	—
Catarrh	—	53	63	78	68	140
Tonsillitis ..	—	24	35	38	33	23
New cases: Chancroid	—	12	33	8	15	4
New cases: Syphilis (1st record)	—	12	17	8	11	5
New cases: Gonorrhœa (acute)	—	58	89	46	60	22
New cases: Total ..	—	82	139	62	87	31
Scabies	43	27	18	40	31	28

Among the individual diseases dysentery has almost disappeared, and enteric fevers appear to have been, for the time at least, mastered by inoculation. The case-mortality, too, which was 23 in 1911, has been reduced to 15 per cent. Malaria had a serious increase, and Mediterranean fever is again increasing. Meningococcus infection was hardly seen. Pneumonia is less prevalent than in former years. Rheumatic fever shows only half as many cases as in 1915, and those are milder. They only last 20 days, and few are invalided or die. Tuberculosis claimed 264 cases, 247 invalids, and 31 deaths, the figures per 1000 working out to 2·38 cases, 2·23 invalids, and 0·28 deaths. The figures ten years ago were very little different. Among the larger groups, cases and invalidings were heavier in the "Marines at Headquarters," but incidence was greatest upon writers (8·77), followed by victualling ratings (4·49), the sick-berth staff coming this year only third with 4·27 per 1000. They had 6·82 in 1911 and 5·42 in 1915, so they have made a distinct improvement, that will, we hope, increase.

Venereal Disease and Malignant Disease.

Venereal disease (9636 fresh infections, 2907 later cases, 143 invalids, 56 deaths) has reasserted itself since the war, and cases are now about as frequent as in 1911. Some medical officers ascribe the increase to drink and carelessness about preventives; Constantinople and the many unfortunate Russian women there, made refugees by the war, and "dependent on prostitution for a livelihood," had a particularly evil influence. At Simon's Town

"no houses are used . . . and intercourse carried out clandestinely in the open," which shows how prevalent prostitution is there. But all kinds of venereal disease were most increased in China, though Hong-Kong shows improvement. Cases in the Atlantic Fleet are double what they were in the Grand Fleet in 1915 (107 against 53 per 1000); the increase is least among Marines at headquarters. Syphilis, first record, shows the greatest increase. Venereal disease now accounts for nearly one-third of the days' sickness of the Navy, and more than a third of the days in hospital; it is a frightful expense. Surgeon-Commander L. Kilroy is complimented on his initiative which established a routine of treatment (see THE LANCET, Dec. 31st, 1921) with benefit to the patients and economy to the service. Diseases of the eye and ear cause much invaliding, particularly in the first year of service, as latent defects are manifesting themselves under training. Appendicitis shows an unexplained increase; skin diseases are fewer, but scabies has increased along with venereal disease. Malignant disease shows a decrease from 1915, when the incidence (0·37 per 1000) was higher than ever recorded before in the Navy; in 1921 it is 0·22. The rise began about 1909, and in the last ten years the prevalence has been, roughly, double that in the preceding decade. We have no figures for the years since 1915, and it is for this reason that we particularly regret the decision of the Admiralty to cancel preparation of the reports for 1916 to 1920. During the preceding years the rate had been rising rapidly on the whole, though with considerable fluctuations from one year to another. For want of the intervening reports we are unable to decide whether the low figure this year signifies a cyclic diminution of malignant disease in the service in the last few years or merely a drop for a year in the activity of a pathological process which is gaining more hold as the time goes on. The solution of this question has interest far outside the Navy, for it is constantly questioned whether the numerical increase in deaths from malignant disease, which is allowed by all to be occurring, depends on some special activity of, or increased susceptibility to, malignant disease, or to the greater age nowadays of the population at risk. In the Navy we are no longer told the age of the men in the service, but we will probably not go far wrong if we conclude that the service is no older, but rather a little younger than before. And yet malignant disease has certainly, on the official figures, increased its incidence from, at a rough average, 0·13 per 1000 in the ten years before 1909, to something so much larger in the succeeding years that a rate of 0·22 in 1921 looks like a drop. Perhaps a cancer research fund might help the Admiralty to get the statistics for the lost years prepared.

The Health of Younger Sailors.

As to the training establishments and the health of the young, so apt to be the test of sanitary administration, the tables and statistics are again a little confusing, for the numbers given on pp. 95 and 182 do not agree.

		P. 95.	P. 182.
Boys	*Impregnable*	1660	1153
Boys	Shotley (*Ganges*) ..	2240	1914
Youths.. ..	*Vivid*	570	570

Again, the number of cases of pneumonia from *Impregnable* is stated, on p. 22 as 18, on p. 182 as 13 per 1000; but these figures correspond to a total complement of 1384. Which of these three figures is correct? In any case there has been a marked improvement this year, for in 1915 there were 30, but in 1921 only 12 cases of pneumonia per 1000 in the training establishments reported upon. What is wanted, however, is a statement of the sickness that occurred in all the training establishments for recruits, cadets at Dartmouth, boys and youths, boy and other artificers, marine, and also stoker recruits. The individuals here reported upon would be excluded from the Home Station tables, which would then represent more exactly the health conditions of the working Navy, which has become accommodated to its work.

Apart from the serious increase in venereal disease, the great question that emerges from the study of this report seems to be: Why does the incidence of tuberculosis on a population of young, strong men, well-clothed, well-fed, well-housed, remain so persistently the same, in spite of every effort?

MALARIA IN MAURITIUS:

A STUDY OF ANOPHELINES.

MAURITIUS has always been interesting from the entomological standpoint. Its remoteness from any of the large land areas of the world has tended towards specialisation, while its communications with Africa on the one hand and Asia, more particularly India and Ceylon, on the other, have led to its exhibiting both African and Oriental species of insect.

Introduction of the Malaria-Vector.

Possibly the most notable event in its entomological history is the supposed introduction of the well-known African mosquito and malaria-vector, *Anopheles costalis*, somewhere about the late 'sixties of last century. If such an event really did occur it was fraught with momentous and disastrous results for the colony, because it was followed by the severe and classical outbreak of malaria which slew well-nigh 32,000 people and drove the European settlers from the coastal belt to the inland heights. Ever since those terrible fever years of 1867–68 malaria has exercised a malign influence on the health and happiness of a large section of the population, has seriously interfered with the economic development of the island, and has been a source of much trouble and expense. The evidence as to the introduction of *A. costalis* has, naturally enough, never been conclusive. In 1867 the association of mosquitoes with malaria was unknown, though not unsuspected, and the malarial parasite had not been determined. Hence we shall never learn definitely how much credence is to be attached to a hypothesis which at first sight appears to have a good deal in its favour and which is discussed at some length in the reports of Ross, Fowler, and Balfour. It is possible that this mosquito has existed for centuries in Mauritius, that malaria was always present there in an endemic form, and that the great epidemic was due to causes other than the chance introduction of *A. costalis*. The new report on the *Anophelinæ* of Mauritius by Malcolm E. MacGregor, entomologist to the Wellcome Bureau of Scientific Research, while it does not clear up the above question, is a most important document and indirectly may be said to shed light on the matter, for it records the discovery of a new African anopheline, *A. funestus*, in Mauritius, regarding which the same problem arises—i.e., has it been there for hundreds of years or has it been recently imported?

Mr. M. E. MacGregor's Visit.

Mr. MacGregor visited Mauritius as the outcome of the inquiries into the medical and sanitary condition of that colony conducted by Dr. Andrew Balfour in 1921. The latter realised that our knowledge as regards the bionomics of the Mauritian anophelines was defective and that it was very necessary to undertake an extensive entomological inquiry combined with intensive anti-malaria work. He submitted a scheme of operations to the Colonial Office, but after consultation with Dr. Guy Marshall, Director of the Imperial Bureau of Entomology, it was decided to institute a preliminary inquiry on a smaller scale. Dr. Balfour had noticed that there was a marked difference in the summer and winter distribution of *A. costalis*, and, owing to the great restriction in the breeding places of this mosquito during the winter months, had suggested that an intensive campaign against the water stages of the mosquito during this season would probably yield important results. He did not think that *A. costalis* hibernated during the

cold weather in Mauritius and therefore believed that conditions were favourable for the type of campaign he advocated. Dr. Marshall considered that further information on the important question of hibernation should be obtained in the first instance and, as a result, Mr. MacGregor undertook the work fully detailed and admirably illustrated in his report. He confirmed Dr. Balfour's views as regards hibernation and the advantages of intensive winter operations against *A. costalis*, but he accomplished much more, for not only did he, as stated, discover that *A. funestus* is an inhabitant of Mauritius, but he made careful and valuable observations on the bionomics of the four species of Mauritian anophelines now known to exist, determined their malaria-transmitting powers, advanced a scheme for their suppression, and discovered in Mauritius no less than 11 species of culicine mosquitoes, hitherto unrecorded from these islands, and one of which, *Ædes mascarensis*, is new to science. He also made a survey of the neighbouring island Dependency of Rodrigues, determined its culicine fauna, and made recommendations with respect to safeguarding this colony from malaria.

A Missed Species.

All these matters and several others of less importance are dealt with in his report, which is divided into two parts, the first dealing with the malaria and mosquito question in Mauritius from the ætiological and bionomical standpoints and devoting also a few pages to conditions in Rodrigues; the second concerned with the scheme for an anti-malaria campaign based to a large extent on the new facts determined as a result of his inquiry. There could be no better example of the value of the work of the trained field entomologist. Take MacGregor's discovery of *A. funestus* in Mauritius. From the evidence he furnishes it is almost certain that this mosquito eluded Ross, Fowler, and d'Emmerez de Charmoy in 1908, while it was also missed by Balfour in 1921, who, however, as MacGregor points out, had a multitude of matters requiring his attention and was unable to concentrate on entomological work. It is scarcely surprising that Ross and his confrères did not encounter the wily *funestus*, for their investigations only occupied three months, and it was not until four months had passed that MacGregor, almost, as it were, by chance stumbled on a larva strange to Mauritius. His account of the discovery and of his further quest for the species savours of the dramatic. He says:—

"On Oct. 11th my scientific assistant, Mr. Gébert, and I were searching in Mare Rohan Pointe aux Sables for the rarer culicine species, when suddenly a small black anopheline larva was found in one of the 'dippers' that had been thrust down at the roots of a small species of bulrush which covered the marsh. I examined the larva carefully by means of a hand-lens, and could see at once that we had apparently found a species that had not been observed in Mauritius before. Continued search in the marsh at this point failed to give us others, so I placed the larva in a collecting tube and returned with it in my motor-car to the laboratory at Reduit without further delay. Examination of the larva under the microscope disclosed the fact that it was undoubtedly the larva of a new anopheline species, and I suspected the larva as *Anopheles funestus*. It was placed carefully aside to undergo its metamorphosis, and as it was fortunately then in the late fourth instar, it pupated and emerged successfully four days later. Examination showed that my surmise was correct and that the emerged specimen was a female *A. funestus*.

Highly astonished by our find, Mr. Gébert and I proceeded again to Mare Rohan to search the marsh from end to end. First searching where the larva had been discovered we could find no others, but later on when we had got to about the middle of the marsh where there was more open water on which, floating half submerged, were numerous dead cocoanut palm leaves, we found enormous numbers of *A. funestus* larvæ, pupæ, and eggs. It became evident that the larvæ and pupæ were to be obtained in largest numbers when we 'dipped' *under* the floating cocoanut leaves."

Later he describes finding *A. funestus* elsewhere, and records a remarkable observation regarding the habits of its larvæ:—

"My assistant and I, who had first noted the fact that the larvæ at Mare Rohan seemed to hide under the leaves of the floating cocoanut palms, started our investigations on the bionomics by searching the recorded breeding places under all floating vegetation. We soon found that the larvæ could most readily be obtained in this manner, but the numbers we succeeded in capturing were disappointingly few. One day while searching a small backwater pool on the Tamarin River (Black River District) where the water was shallow, and where numerous flat leaves of a water plant dipped below the surface, we found that by dipping under the leaves and close against the bank of the pool, large numbers of the *A. funestus* larvæ were obtainable. By dipping in any other way, even only a few inches from the bank, not a single larva could be found.

Stopping my work and remaining motionless where I stood, I stooped and peered carefully down at the weeds near the bank. Greatly to my surprise, I saw scores of *A. funestus* larvæ ranged in lines lying on the water surface as close in to the bank as it was possible for them to get. A movement on my part which disturbed the vegetation caused some to dive, and many *to wriggle up out of the water on to the wet leaf surfaces*. Resuming a motionless position, I noticed that after the lapse of a minute or two these larvæ would wriggle down to the water once more, and, with the others that had dived, would in time, if not again disturbed, swim a few yards away from the bank. The slightest movement, such as treading lightly on the ground, was sufficient to alarm the larvæ, and they would dart to the bank, and if further alarmed would either dive or climb up the leaves once more.

The explanation why it was that we had overlooked *A. funestus* while searching for the larvæ of *A. costalis*, *A. maculipalpis*, and *A. mauritianus* was then obvious; for the three latter species, like most anopheline larvæ, are easily captured by dipping in the open water or near the banks. The larvæ of *A. funestus* by taking refuge far in at the extreme edges of the ponds, marshes, &c., are almost safe from the dippers when these are used in the ordinary way."

MacGregor is inclined to think that *A. funestus* may have been introduced comparatively recently into Mauritius from Madagascar, but he admits that it and the other three anophelines, *A. costalis*, *mauritianus*, and *maculipalpis*, the last of which he found to be exceedingly numerous in many places, may have existed on the island for centuries. His discovery of *A. funestus* has much hygienic importance, for this anopheline in its developmental stages prefers shade, whereas *A. costalis* shuns it. At the same time, it is fortunate that the distribution of *A. costalis* is conterminous with and overlaps that of *A. funestus* so that no extension of anti-mosquito measures to *new localities* is required.

Seasonal Distribution of Anophelines.

The following table presents in a concise fashion the variation in the summer and winter distribution of the four anopheline species:—

WINTER.	SUMMER.
Anopheles mauritianus.	*Anopheles mauritianus.*
Dispersion: From the coast to the highest altitudes all over the island. Large numbers of larvæ, pupæ, and adults obtainable.	Dispersion: As in winter. Numbers obtainable not noticeably changed.
Anopheles maculipalpis.	*Anopheles maculipalpis.*
Dispersion: Restricted to special types of breeding places from the coast occasionally up as high as 1200 feet. Considerable numbers obtainable.	Dispersion: As in winter. Numbers appreciably increased.
Anopheles costalis.	*Anopheles costalis.*
Dispersion: From the coast to 1200 feet at many places. Large numbers obtainable at lower altitudes, and very few near the altitude of 1200 feet. Found once at 1800 feet (Forest Side).	Dispersion: From coast to 1800 feet (in cattle hoof-holes at Forest Side). (Dagoutiers, Parc aux Cerfs, and Quartiere Militaire, 1500 feet.) Numbers very greatly increased, both at the coast and inland areas.
Anopheles funestus.	*Anopheles funestus.*
Dispersion: From the coast, but not above an altitude of 500 feet. Large numbers obtainable at the coastal belt.	Dispersion: From the coast to 500 feet (Valton estate).

The author lays much stress on what he calls the "inland winter refuges" of *A. costalis*. Indeed, his plan of campaign, which cannot be here detailed, centres round these limited specialised breeding places. He regards the outlook in connexion with the suppression of malaria as hopeful provided, and this is all-important, that those in charge of the

operations are independent of, though working in close association with, the local medical and health department, and that public interest and sympathy are aroused by appropriate propaganda work. He agrees with Balfour that the present malaria statistics are entirely unreliable, that the recorded mortality from malaria is fallacious, but that malaria is undoubtedly an important economic factor in the welfare of the colony.

Mauritius and Rodrigues.

He contrasts Mauritius with Rodrigues. There is no malaria in the latter for there are no anophelines there, and its inhabitants compare in general health and physique very favourably with the malaria-saturated Creoles and Indians of Mauritius. He explains how the barrier coral reef by keeping vessels off shore has indirectly prevented anophelines reaching the island, and he puts forward a strong plea against the project of building a jetty from Port Mathurin out to the edge of the reef. Such a development would almost certainly abolish the immunity Rodrigues enjoys as regards both anophelines and malaria and would be a disastrous undertaking. It is to be hoped Mr. MacGregor's recommendation will not go unheeded.

There are many other matters of interest in this valuable contribution to the literature of mosquitoes and malaria. It should be read and studied by all interested in these kindred subjects and also by those who, in virtue of their official position, are charged with the double duty of safeguarding and benefiting the public health of tropical communities.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

"Papa" Pinard.

THE Chamber of Deputies has elected as its President with great unanimity, Prof. Pinard, the veteran obstetrician, whose playful title of "papa" is in acknowledgment of his having brought more than 20,000 children into the world. At the outbreak of hostilities in 1914 Pinard relinquished a brilliant university career to coördinate all the child welfare agencies in Paris. A central office was instituted at the Maternité, from which went out a band of devoted voluntary workers; and during the first four years of the war nearly 14,000 pregnant women were cared for in municipal or private homes, and another 13,000 nursing mothers in refuges where they could remain until their infants were weaned. Pinard is regarded indeed as the founder of puericulture in France and as the one who saw clearly the fearful threat to child-life involved in the absorption of married women into factories. Retiring in 1920 under the age-limit from the chair of puericulture in the Medical Faculty, he became a deputy in the new chamber and at once propounded there a scheme for an enormous nursery to accommodate 1500 children with their mothers, a scheme which enlisted the sympathy of the Minister of Hygiene, Mr. Breton. Prof. Pinard celebrates this year the eightieth anniversary of his birthday and his jubilee as a member of the medical fraternity.

Aneurysm of the Internal Carotid.

Dr. Rouvillois, of the school of military health service at Val-de-Grâce, recently reported to the Academy of Medicine a case of arterio-venous aneurysm in the intracranial portion of the internal carotid artery. The formation of this aneurysm was due to a somewhat rare cause. The cause of arterio-venous aneurysm is usually a direct injury to the vessels, but in this case not even the slightest wound was to be found either in the neck, mouth, or pharynx of the patient, who was 22 years old. He had been flung forcibly to the ground by the bursting of a large shell, and following this violent trauma the signs of aneurysm appeared. It is therefore logical to suppose that an arterio-venous communication was caused by the violent contusion, an uncommon occurrence. Complete recovery followed the operation of applying a quintuple ligature and completely removing the aneurysm. The aneurysm itself consisted of an arterial sac, in addition to the arterio-venous communication, which was adherent to the wall of the pharynx.

The Therapeutics of Long Sea-Voyages.

In a recent communication to the Academy of Medicine the port sanitary officer of Havre, Dr. Adrien Loir, recalled the large number of works published in England before 1890 dealing with the therapeutics of long sea-voyages. At that time long sea-voyages were widely advocated by English doctors, and remarkable results were achieved. French doctors, Dr. Loir urged, should make themselves familiar with the question which was so carefully studied by Dr. J. Burney, Dr. A. Crosbee Dixon,[1] and others, in particular Dr. Hermann Weber and Dr. A. Parkes Weber, while in 1892 further articles on this subject had appeared in THE LANCET. While in England on a mission on behalf of the League of Nations Dr. Loir studied this literature and commends the investigation of the therapeutics of long sea-voyages to his colleagues.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

Bacterial Purification of Rivers.

AN unusually interesting programme was enjoyed by the Society of Hygiene of Johns Hopkins University on May 12th. Dr. W. H. Frost, professor of epidemiology, discussed bacterial purification in the Ohio river, a study of which was undertaken by the U.S. Public Health Service some ten years ago. A maximum bacterial count was found not at the sewer outfalls (of which there were six in the portion of river studied), but some 12 hours lower down the river. This may possibly be due to breaking up of clumps of bacteria; Dr. Frost did not consider it probable that there was any multiplication of bacteria in the water. Attempts to fit curves to the observed decrease of bacterial counts were most successful when the counts at the actual sewer outlets were disregarded. Curves then showed that purification takes place at a diminishing rate. Observations in winter months showed further that the purification takes place more slowly at lower temperatures. These experimental studies are to be continued.

Experimental Measles.

Dr. Joseph M. Scott presented a report of the experimental work on measles which he is doing in collaboration with Dr. Charles E. Simon. Filtered washings of swabs from measles throats were injected intravenously into a series of rabbits. Daily swabbings were taken and an injection into rabbit made each day from each of six members of the family in which measles cases were occurring. Passage of the virus through a series of rabbits gave a virus of fixed character producing elevation of temperature, leucopenia, relative decrease in polymorphs, and relative increase in basophils. Exanthems and enanthems were not noted, nor was erythema. They consider it essential to make differential blood counts to determine measles infection in the rabbit. Rabbits that have had "measles" are found to be immune to the virus. Three out of five rabbits contracted "measles" from exposure in the same cage with experimental animals that had been infected intravenously. Attempts to obtain infective virus from the dust and air in the vicinity of measles patients gave negative results, but material from secretions of nasopharyngeal membranes of measles patients gave constantly positive results. Even when the material had been

[1] Sea Voyages for Health, THE LANCET, 1888, ii., 264.

allowed to dry on the handkerchief for as long as four days, positive reactions in rabbits were obtained. A very satisfactory series of control experiments adds to the value of the results obtained. Further experiments will be undertaken to determine the period of viability of the virus in the throat and on material outside the body. So far, 180 rabbits have been inoculated. Three monkeys inoculated with the rabbit virus produced a characteristic eruption in one case, and rise of temperature and leucopenia in all three. In the discussion Dr. Simon emphasised that the twentieth rabbit in a series of rabbit-to-rabbit infections acquired immunity to an active human virus which produced a typical reaction in control animals.

BUDAPEST.

(FROM OUR OWN CORRESPONDENT.)

Milk Injections in the Treatment of General Paralysis.

ENCOURAGED by the results described by Prof. Wagner-Jauregg, of the Vienna University, in the treatment of G.P.I. with the protein therapy and inoculation of malaria, some Hungarian neurologists have given a trial to this new method. Particular interest attaches to the fact that the experiments were carried out in the clinic of Dr. Moravcsik, director of a large psychiatric institute and lecturer on nervous and mental diseases in the Budapest Royal University, his clinic being known for more than 30 years as being strongly conservative. The experiments were begun in 1920 with tuberculin, and then an interesting chance directed attention towards milk injection. A patient, suffering from advanced general paralysis, had a carbuncle on his neck, which had been incised and bandaged. The patient, however, had torn off the bandage and smeared the wound with fæces, causing an extensive inflammation round the wound, with gangrene of the edges. As this condition aggravated his mental state, a surgical specialist was consulted, who recommended the application of milk. The patient was given 10 c.cm. of sterilised milk under the skin of the abdominal wall on October 19th, 1920; the same day he had a temperature of 40° C., which subsided on the following morning. From this time onwards his wound improved rapidly, and his bodily strength began to return. Within one month his wound was totally healed. In December his mental condition began to improve, his restlessness ceased, his behaviour showed ever-increasing coördination, and on Feb. 21st, 1921, he left the clinic quite composed. Doubtless, the chief factor in the patient's improvement was the long-continued suppurative process, nevertheless the change in the patient's condition after administration of the milk injection was so striking as to merit further study, and the doctors of the clinic felt entitled to experiment more extensively with the injections. By this method they treated 40 cases of general paralysis, many of chorea, and several of epilepsy. Dr. Moravcsik stated that he felt justified, in view of the results obtained, in considering milk to be the most efficacious of the non-luetic therapeutic measures (milk, phlogetan, and tuberculin) administered at the clinic, and that the results of milk therapy were much superior to those of antisyphilitic treatment in G.P.I. He considered milk to be a very valuable addition to the scantily furnished armamentarium against general paralysis. In ten cases of chorea minor the milk protein therapy gave excellent results. The explanation of the efficacy of protein therapy, in that it is due to leucocytosis, activation of the protoplasm, stimulation of antibody-forming elements, increased transfusion and hyperæmia in the diseased foci, &c., is at present only theoretical, and must be confirmed by further and more detailed experiments. On a parallel with this, Dr. Moravcsik contends, protein therapy must be applied on a wider scale in nervous and mental diseases. The ultimate value of the treatment can only be decided after extensive clinical experiment.

Soap Inunction for Lung Diseases.

The Central Tuberculosis Dispensary of Budapest has made extensive experiments on the efficacy of turpentine soap ointment, a method of treatment which has been much recommended by some continental authorities. Dr. Aladar Bathory, who controlled the experiments, employs the following composition :—

R	Potash soap		
	Yellow vaseline	.. āā	15·0 g.
	Carbonate of potash		0·5 g.
	Beechwood creosote.		
	Turpentine oil.		
	Camphorated oil.	āā	3·0 g.

M. fiat ung.

This is quite a soft ointment, with which the back, chest, and arms of the patient are anointed every alternate day. It is advisable to have the inunctions made by a nurse, and about a teaspoonful of the ointment is applied at one time. Dr. Bathory selected for treatment such patients as were not suited to specific treatment, owing to high fever or to extensive destruction of the lungs. His results were as follows: After one or two weeks' treatment the patient's subjective symptoms improved considerably, the temperature was lowered, and in some cases reached normal. There was decided improvement in the patient's outward appearance; facies and gait showed greater tone. Those who had come for treatment with an escort were able in two or three weeks to come alone. In one case extensive œdema of the lower limbs disappeared completely, the cough was greatly reduced, and the appetite increased. The disappearance of catarrhal rhonchi in the lungs was striking. As regards the effect of the treatment on the skin, nothing was to be noted beyond a slight hyperæmia. No disturbing symptoms were shown either by the kidneys or other organs. Further investigation into this method is being carried out at this institution.

The Services.

ROYAL NAVAL MEDICAL SERVICE

Surg. Comdr. G. Nunn and Surg. Lt.-Comdr. F. L. H. MacDowel to the *President* for hospital course.

Surg. Rear-Admiral Sir A. Reginald Bankart is placed on the Retd. List at own request to facilitate the promotion of junior officers.

ROYAL ARMY MEDICAL CORPS.

Capts. G. Fleming and A. K. Forbes retire receiving a gratuity.

Lt. L. F O'Shaughnessy resigns his commn.

TERRITORIAL ARMY.

C. R. Dudgeon (Maj. R.A.R. of Off.) to be Capt.

Supernumerary for Service with O.T.C.—Capt. (Bt. Maj. J. B. Orr, from Gen. List, to be Capt. (Bt. Maj.) and to command Inf. Unit, Aberdeen University Contgt., O.T.C.

Lt. C. S. Atkin to be Capt.

ROYAL AIR FORCE.

R. T. F. Grace is granted a short service commission as a Flying Officer.

F. S. S. Whiter (temp. Lt., Dental Surgeon, General List Army) is granted a temporary commission as a Flying Officer on attachment to the R.A.F.

INDIAN MEDICAL SERVICE.

Lt. Col. A. Hooton to be Major-General, and Lt.-Col. T. B. Kelly to be Col.

Capt. D. C. McNair relinquishes his tempy. commn. and is permitted to retain the rank of Capt.

The King has approved the retirement of Col. Bhola Nauth.

INDIAN MEDICAL SERVICE DINNER.

The annual dinner of the Indian Medical Service will be held at the Trocadero on Wednesday, June 18th, Colonel J. J. Pratt in the chair. Tickets and all particulars may be obtained from the honorary secretaries, 63, Addison-road, Kensington, W. 14.

Public Health Services.

INQUIRY COMMITTEES ON THE CONDUCT OF PANEL DOCTORS: A QUESTION OF PROCEDURE.

BEFORE a Divisional Court recently the Attorney-General appeared to show cause against a rule nisi obtained by two medical men, practising in partnership, Drs. A. B. and C. D., who sought to quash an order of the Ministry of Health directing that £1000 should be withheld from the remuneration payable to them by the Insurance Committee in respect of their panel patients. The name of each doctor appeared on the Lancashire Insurance Committee's panel, but only Dr. A. B. had a list of insured persons, the other partner, Dr. C. D., acting as Dr. A. B.'s deputy when attending these patients. Complaints having arisen that the doctors were improperly charging fees to insured persons, an investigation by the Medical Benefit Subcommittee under Part V. of the Medical Benefit Regulations was instituted into the complaints against Dr. A. B. only. On a consideration of the report of this subcommittee, the Minister suggested that the Insurance Committee should make representations under Part VI. of the Regulations in respect of *both* doctors that their continuance on the panel was prejudicial to the efficiency of the insured. The committee made representations accordingly, and the Minister appointed an inquiry committee. On consideration of the inquiry committee's report the Minister decided that the doctors' names should not be removed from the medical list, but that £1000 should be withheld from their remuneration.

In his opening speech against the rule the Attorney-General submitted that it was a fundamental principle of the National Insurance system that medical practitioners under it should be paid by capitation fees and should accept no other remuneration from their panel patients, except in accordance with Regulations. He expressed the view that the court would have no desire, if it should be found to have the power, to review the discretion of the Minister or to inquire into the severity of the penalty imposed. The points at issue in the case were technical matters relating to the procedure adopted. The question was whether an investigation by the Medical Service Subcommittee under Part V. of the Regulations was a condition precedent to the holding of an inquiry by the Minister under Part VI. of the Regulations. He submitted that the investigation under Part V. had nothing to do with the inquiry under Part VI. Sir William Finlay, K.C., who represented the medical men in support of the rule, pointed out to the court that only technical points were open to him and that he was precluded from going into the merits of the case or into the amount of the penalty. A preliminary investigation had been held under Part V. of the Regulations into complaints against Dr. A. B. only. This had been followed by an inquiry under Part VI. into the conduct of both doctors. As there had been no investigation by the Medical Service Subcommittee under Part V. in respect of both doctors, there had been no proper inquiry under Part VI. On behalf of Dr. C. D., it was argued that as he had no list of insured persons, but merely acted as Dr. A. B.'s deputy, he had not treated insured patients under the terms of a contract with the Insurance Committee and that no representations against him could be made to the Minister. After the arguments of counsel had dealt with the technical points involved at some length, the Lord Chief Justice, in giving judgment in discharging the rule nisi, said that the contention had not been pressed that an investigation by the Medical Service Subcommittee under Part V. must necessarily precede every inquiry under Part VI., but it had been argued that a representation by an insurance committee with regard to an inquiry under Part VI. could only be made as provided in Part V. 30 (2)—i.e., in the committee's report to the Minister following an investigation by the Medical Service Subcommittee. While the committee had a discretion to make a representation in this particular way, he considered the powers given in Part VI. Articles 41 and 42 (regarding the making of representations and the holding of inquiries) were general and that representations could be made, as had been done in the case of these doctors. In their case, after the Medical Service Subcommittee had reported, the Minister had recommended the Insurance Committee to proceed by representation under Part VI. This had had as its result the decision to deduct by instalments the sum of £1000, and in his view the action of the Minister was not *ultra vires*. Mr. Justice Roche and Mr. Justice Branson concurred, the latter stating, as regards the position of Dr. C. D., that he was a panel practitioner and his terms of service were that he should not take private fees from panel patients.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following table gives some of the principal health statistics for 1923 of one county borough, six boroughs, and one urban district, the health reports of which are commented on below:—

Name of district.	Estimated mid-year population (R.-G.).	Birth-rate.	Death-rates per 1000 of the population.				Death-rates per 1000 births.		
			All causes.	Tuberculosis.	Cancer.	Respiratory with influenza.	Neonatal mortality.	Infant mortality.	Maternal mort. from childbirth.
Eastbourne C.B.	53,900	13·3	9·7	0·9	1·3	1·4	25	39	†
Ramsgate B. .	30,250	20·7	12·9	1·1	1·5	1·7	19	45	0·0
Margate B. ..	28,080	17·3	10·6	1·3	1·6	1·0	†	43	6·2
Hendon U.D. .	56,690	16·3	7·9	0·6	1·0	1·1	29	46	4·3
Gillingham B. .	55,200*	19·4	10·2	1·3	1·1	1·4	24	48	0·9
Watford B. ..	47,100	18·3	8·5	0·8	1·2	1·4	31	50	2·3
Hyde B.	34,030	16·4	12·9	1·2	1·5	3·4	37	68	5·3
Stafford B. ..	29,370	16·7	8·8	0·9	1·1	1·4	33	55	4·1

* Gillingham's population for the calculation of death-rates is 47,620.

† Indicates that the information is not given in the report.

Eastbourne.

Dr. W. G. Willoughby reports that housing is still the most adverse factor in this county borough and that the outlook is only very gradually improving. However much one may theoretically believe in private ownership, he says, there is no alternative to State housing if private owners refuse to let houses to families with young children. Such an attitude on the part of private owners is common in Eastbourne. For the municipal houses, on the other hand, preference is given to large families. Dr. Willoughby considers that about 700 new houses would meet present requirements. The houses completed during 1923 numbered 102, of which 30 were municipal houses. All the municipal houses have baths, and the rents are 18*s.* 4*d.* per week for parlour houses and 14*s.* 8*d.* for non-parlour houses. Reference is made to the hopeless state of the law as regards milk which does not come up to the standard of 3 per cent. for fat and 8·5 per cent. for non-fatty solids. The only two prosecutions undertaken failed. Some of the special difficulties of the tuberculosis scheme are the want of satisfactory housing accommodation, of hospital provision for surgical tuberculosis, and of suitable employment for tuberculous persons who can do a

little work. The municipal maternity and infants' home did useful work; 17·6 per cent. of all the births in the borough took place there and 32 ailing infants were admitted in addition to those born in the home. Considerable trouble has been experienced with regard to unqualified women acting as midwives, and the proviso in the Act as to "habitually" and "for gain" makes legal action difficult.

In his school report Dr. Willoughby says it is too early to speak as to the effect of the introduction of the system of charging for treatment, but he is glad the board have allowed them some latitude in the application of the new regulations. Permission to establish a massage and electrical clinic was refused, but fortunately the work has been carried on at a voluntary clinic. The reduction of uncleanliness and verminous conditions in the schools is marked in recent years. There are many refusals to accept dental treatment. The open-air school, formed out of army huts and opened in June, 1920, has fully justified its existence, and its accommodation has been increased to 75 places. Medical inspection of the 658 children in the two municipal secondary schools showed that 272 required treatment or observation. For the majority of these the parents were asked to provide medical attention, but 33 were treated free at the school clinics. Dr. E. H. Coghill reports that among the girls the outstanding defects were enlarged tonsils and enlarged cervical glands, probably arising from tonsils and teeth. The general physique was good and cases of spinal curvature few. As regards the boys, Dr. T. Turner reports a gratifying reduction in flat-feet, which he attributes to the disappearance of the effects of poor feeding during the war. Enlarged tonsils and adenoids are now negligible, owing to treatment, breathing exercises, &c., during the earlier school period. Dental caries is, however, much too common.

Ramsgate.

Dr. W. J. Bannister also says that housing is still the most pressing problem, and that the only hope for an adequate provision of small houses lies in a State or municipal scheme. No municipal houses were erected in 1923. Two of the 121 cows housed in the borough were found to be suffering from generalised tuberculosis and were destroyed at the knacker's yard. Most of the meat sold is imported foreign meat. Efficient supervision of the meat killed in the borough is not possible owing to the situation of the various private slaughter-houses and the fact that killing goes on at all hours. On the other hand, the butchers have an insurance scheme against condemnation, which encourages the notification of suspicious meat to the health department. The council's station for the sterilisation of shell-fish dealt with 34,614 gallons of cockles during the year. The premises on which ice-cream was made and stored were reported to be satisfactorily kept. The school report shows that seven of the nine elementary schools are non-provided and do not comply with modern sanitary requirements. Six prosecutions of parents were undertaken for uncleanliness of their children. Many of the children, found to be in a pre-tuberculous condition, have to be excluded from school for long periods, in the absence of an open-air school. During the year 152 children were found to have enlargement of tonsils or adenoids. In most cases the condition yielded to attention to carious teeth, &c.; only 14 cases received operative treatment. The school dentist, Mr. P. H. Hickman, reports that many parents refuse treatment for their children. No organiser of physical training for the area has been appointed, although Dr. Bannister reports strongly in favour of such an arrangement.

Margate.

Dr. Rowan McCombe refers—the reference is cumulative—to the handicap to the standard of health and cleanliness resulting from the deplorable shortage of houses. In 1923, 22 municipal houses were built, but 300 are needed immediately. In the older parts of the town not only cottages but also better-class houses have no bathrooms, and the provision of public baths is greatly needed. Of the four midwives practising in the town, two are municipal and occupy their spare time in antenatal visiting. In his school report Dr. McCombe reports that uncleanliness has been more prevalent among the school-children during 1923. He would like to have some more prompt and direct method of dealing with apathetic parents, such as power to cut the hair short or making it an offence to send children to school with verminous heads or bodies. Dr. McCombe would also like to see an open-air school established to accommodate 20 to 30 children.

Hendon.

"Happy Hendon" had, Dr. T. S. McIntosh tells us, no public health history in 1923. A scheme is in course of preparation for the coördination and extension of the child welfare and school medical services, and more supervision is needed of children between the ages of 2 and 5. Hendon is apparently unique among urban districts in having no housing problem. The number of houses erected during 1923 was 625, of which 20 were municipal. One closing and demolition order was carried out, and at the end of the year there were no houses unfit for habitation.

Gillingham.

Dr. W. A. Muir reports that the isolation hospital is unsuitable for its purpose and its site too small. Suitable sites for a modern hospital have been offered, and it is suggested as an alternative that the borough might join with the neighbouring boroughs of Chatham and Rochester. Like the medical officers of many large urban districts, Dr. Muir thinks the supervision of midwives should be transferred from the county council and form part of the Gillingham maternity and child welfare scheme. Two firms in Gillingham now sell wrapped bread and the hospital committee are among their customers. The chief sanitary inspector attended the demonstration of methods of slaughtering arranged by the National Federation of Meat Traders' Associations. Dr. Muir refers to the view of the Federation that the humane killer interferes with the keeping properties of the meat, more especially of pig's flesh, with regard to which investigation is still taking place. There is still a marked shortage of houses, but no municipal houses were built during the year. About £15,000 was advanced during the year ended March 31st, 1924, to enable tenants to acquire the ownership of their houses under the Small Dwellings Acquisition Act, 1899.

Watford.

Dr. W. J. Cox prefaces his report on housing by extracts from a speech delivered by the King at a housing reception held at Buckingham Palace on April 11th, 1919. Since then nearly 1000 municipal houses have been erected, but 1000 more are needed. There are about 300 houses unfit for habitation, many of them in an extreme state of disrepair and some indescribably filthy and infested with rats and other vermin. The Infants' Home at Little Nascott, which was originally started as a war creche, is now serving a useful purpose as a home for the reception of delicate and ailing babies, 44 of 77 admissions during the year being of that type. A dental clinic has been begun for nursing and expectant mothers, and children under school age. The Watford special school for mentally defective children (accommodation 40) continues to do good work.

Hyde.

Dr. Nicolas Gebbie, like his colleagues, refers to the shortage of houses and overcrowding. His references to the smoke problem leave the impression that practically no action is being taken with regard to mill and factory chimneys. He states that the smoke problem "is in large measure a problem of the household chimney." A glance at the statistical table above tempts one to suggest that industrial

smoke may be one reason why the death-rate from respiratory diseases in Hyde is nearly three times that of the other towns and that industrial smoke may be worth while tackling, whilst the public is being slowly educated in the matter of the domestic use of coal. In his report on the maternity and child welfare work Dr. Gebbie refers to the high neonatal mortality, and says the antenatal branch of the work does not increase like the rest of the work and that, so far, only a few of the midwives have availed themselves of the invitation to bring or send cases to the antenatal clinic. The school dentist, Mr. E. A. P. Parker, reports that of the children selected for treatment about 78 per cent. avail themselves of the opportunity.

Stafford.

Dr. J. T. Macnab says housing difficulties continue to be acute but that fresh activity is being shown, and it is hoped that the current year will bring some relief. Dr. Macnab advocates the protection of children during their school career against diphtheria by the administration of the two or three necessary injections of toxin-antitoxin. This offer is now made to parents in Stafford. Referring to the high neonatal mortality and the crowding at the infant welfare centres, Dr. Macnab mentions that sanction has been asked to the appointment of a second health visitor in order to enable antenatal work to be done and the holding of more sessions at the centre. A duplicate water main from Milford was brought into use early in the year, so that the supply of the town is now protected against accidental stoppage. Cesspits and privies will be abolished as the result of the completion of the new sewers at Rising Brook and Doxey. Waste-water closets cause much trouble by becoming blocked, the liability to stoppage being about eight times that of the pedestal w.c. with flushing cistern.

SCHOOL MEDICAL SERVICE.

Glasgow.

IN Scotland the school year now ends on July 31st and the medical officer's statement is incorporated in the Director of Education's annual report. It is difficult from this rather brief statement to get an adequate idea of the enormous amount of good work, much of it pioneer, which we know is going on in Glasgow. The total number of children for whom the education authority is responsible is 194,267, of whom 790 are under 5 years of age and 1134 over 14. Thirteen hostels are in operation for children whose parents have to leave them during the day. In seven cases nursery sections are attached for children from 2 to 5 years of age. These children are looked after by women appointed for the purpose, while in the larger nursery schools teachers are in charge. During the year 32,639 children came under routine medical inspection, and of these 45·2 per cent. were found with defects. There are six principal and 12 subsidiary clinics, with, in addition, two special clinics for tonsil and adenoid operations and ringworm and favus cases. The treatment of chronic otorrhœa by zinc ionisation has been extended, and during the year 152 of these cases were dealt with. The statistics regarding treatment show a considerable increase in cases generally, which is in part attributed by Dr. E. T. Roberts to the industrial depression. There was an increase of 17 per cent. in ear cases, 6 per cent. in eye cases, 10 per cent. in skin disease, and 24 per cent. in other diseases. The large increase of 44 per cent. in the number of cases of chronic suppuration of the middle ear was possibly due to the severe epidemic of measles which occurred in the first half of 1922.

From a survey of heights and weights for the five pre-war and four post-war years it appears that war-time conditions have resulted in a slightly improved physique among the children. There is a post-war increase in 13 of the 16 averages given. At the same time the lowered state of health found among the children for 1922 is continued into 1923. During one month of the winter of 1922 four mild cases of sore throat made their appearance in the Langside Deaf and Dumb Institution. Bacteriological examination revealed these as cases of diphtheria. Swabs of 130 children and 43 members of the staff were taken, and 35 positive or potential carriers discovered. These were kept under strict supervision until bacteriologically negative, and a Schick test was carried out with the consent of the parents on 115 pupils and on 35 consenting members of the staff. The results were positive in 36 cases. All susceptible pupils were immunised against the disease, and as a result of such prompt and thorough methods no further cases occurred in the institution.

Radcliffe.

Dr. John Gibson deplores the uncleanly state of the Radcliffe schools, and points out what his predecessor, the late Dr. D. P. M. Farquharson, reiterated time after time: "If a child is brought up in a dirty, overcrowded home and attends a school where no one seems to care if the floor and windows are dirty and dust is seldom disturbed, then that child will in later life be quite content with a low standard of cleanliness." He suggests that the children might assist in the cleansing of their classrooms. The remedy proposed is distinctly a debatable one, but something ought to be done to remedy conditions where, as was pointed out in 1921, "dust lies thick on every place where it can find a lodgment." The outside sanitary arrangements here are evidently good, but the administration is bad; at some of the schools where the trough system of closets is in use they are flushed but once a week. Flushing twice a day should be the rule laid down for every school. During the year there were 2924 attendances at the dental clinic, the number of scalings and cleaning being 309. The school dentist, explaining this apparently large proportion, says that even though the use of the tooth-brush is unknown in many homes, he very much doubts its efficacy in the prevention of dental caries. Out of a school roll of between 3000 and 4000 considerably more than half were medically examined. By an arrangement with the school attendance officers all children absent from school on account of sickness are at once notified to the medical officer and are visited by the school nurse. This is considered one of the most important duties of the nurse. There are two nurses employed, at salaries of £181 and £166 10*s.* (including bonus).

INFECTIOUS DISEASES IN ENGLAND AND WALES DURING THE WEEK ENDED MAY 31ST, 1924.

Notifications.—The following cases of infectious disease were notified during the week—namely, small-pox, 75 (as against 101 the previous week); scarlet fever, 1450; diphtheria, 788; enteric fever, 88; pneumonia, 900; puerperal fever, 45; cerebro-spinal fever, 14; acute poliomyelitis, 6; acute polio-encephalitis, 1; encephalitis lethargica, 251 (as against 261 the previous week); trench fever, 1; dysentery, 9; ophthalmia neonatorum, 150. There were no cases of cholera, plague, or typhus fever notified during the week. Of the 14 cases of cerebro-spinal fever 6 were notified from the County of London (Bermondsey 1, Hackney 2, St. Pancras 1, Shoreditch 1, Woolwich 1), 2 from Durham (Sunderland), and 1 each from Cumberland (Carlisle), Lancaster (Liverpool), Northampton (Wellingborough), Somerset (Weston-super-Mare), Surrey (Wimbledon), and Yorks, W. Riding (Bradford). Of the cases of encephalitis lethargica 23 were notified from the county of Durham (Sunderland 9, West Hartlepool 1, Felling U.D. 1, Hebburn 2, Ryton 1, Spennymoor 2, Auckland R.D. 1, Chester-le-Street R.D. 1, Easington R.D. 1, Sedgefield R.D. 2, Sunderland R.D. 2), 24 from Lancaster (Liverpool 8, Manchester 4), 23 from Warwick (Birmingham 16), and 27 from Yorks, W. Riding (Sheffield 10).

Deaths.—In the aggregate of great towns the deaths from influenza fell further from 67 to 52. There were in London 9 deaths from diphtheria, 12 only from measles.

FOREIGN DECORATIONS.—The King has given to Mr. Douglas Erith Derry, M.B., Ch.B. Edin., licence and authority to wear the Decoration of the Order of the Nile (Insignia of the Third Class), which has been conferred upon him by the King of Egypt in recognition of valuable services rendered.

THE GENERAL MEDICAL COUNCIL.

(*Concluded from p. 1173.*)

Penal Cases.

THREE penal cases came before the Council on the last day of the May session.

The first was brought by the Medical Defence Union against a practitioner on the following charge:

"That, being a registered medical practitioner, you have employed as your assistant in connexion with your practice, one—namely, ————, not duly qualified or registered under the Medical Acts, and have knowingly allowed him on your behalf to attend and treat patients in matters requiring professional discretion or skill; and that in relation to the facts so alleged you have been guilty of infamous conduct in a professional respect."

After deliberation the President announced that the Council had decided to dismiss the case, but thanked the complainants, as on prima facie evidence they had a reasonable case.

The second case was brought before the Council by the Dental Board. A registered medical practitioner was charged with giving a written testimonial to an unqualified dentist stating that "you believed he had a perfectly good reputation" and that "you considered him quite suitable for inclusion in the Dentists Register," whereas the dentist was not personally known to him, nor did he know anything of his moral character. The Council warned the practitioner and did not see fit to erase his name from the Register.

The Case of Dr. Frederick John Fehrsen.—The Cape Medical Council referred to the General Medical Council the case of Frederick John Fehrsen, registered as of Sea Point, Cape Town, M.B., C.M., 1879, M.D., 1884, U. Aberd., who had been summoned to appear before the Council on the following charge:—

"That, being a registered medical practitioner, you wrongfully, unlawfully, and with intent to procure the miscarriage of one Martha de Lange, performed certain operations upon her, and thereby wrongfully, unlawfully, and wilfully procured her miscarriage, of which offence you were on Nov. 13th, 1922, convicted after trial by jury in the Supreme Court of South Africa at Grahamstown, Cape of Good Hope, and in respect of which offence you have been since judged by the Colonial Medical Council of South Africa to have been guilty of infamous and disgraceful conduct, and your name has been erased from the Register of Medical Practitioners of the Province of the Cape of Good Hope; and that in relation thereto you have been guilty of infamous conduct in a professional respect."

The Council directed the Registrar to erase the name of Frederick John Fehrsen from the Medical Register.

In regard to the case of Henry Love, mentioned in THE LANCET last week, the facts alleged against him in the notice of inquiry having been proved, an opportunity was given to him of reconsidering his position, judgment being postponed until May, 1925.

DENTAL BOARD OF THE UNITED KINGDOM.

FINAL SITTING OF THE FIRST BOARD, MAY 13TH–16TH.

THE final sitting of the first Dental Board was held from May 13th to 16th, and we have already summarised the opening address[1] of the Chairman, Mr. Francis Dyke Acland. The other members of the Board who attended the sitting were Mr. L. G. Brock, Mr. W. H. Dolamore and Mr. W. H. Gilmour (nominated by the Ministry of Health), Mr. D. M'C. Cowan and Mr. W. Guy (Scottish Board), Mr. J. H. Stirling and Mr. E. L. Sheridan (Lord Lieutenant of Ireland), Mr. H. J. Waring, Sir James Hodsdon and Sir Arthur Chance (General Medical Council), Mr. F. Butterfield and Mr. H. A. Robertshaw (Privy Council).

[1] THE LANCET, May 24th, p. 1066.

Penal Cases.

Eight disciplinary cases were the subject of consideration. The first case, that of a dentist, 1921, charged with making a false statutory declaration in regard to the employment of an assistant, was dismissed as not proven. In the second case an L.D.S. convicted of indecent exposure was put on probation until the November sitting. In the third, a dentist in practice on July 22nd, 1878, was charged with advertisement on the cover of an almanack, and with improper use of the letters "R.D.S." The facts alleged being proved, an assurance was accepted not to transgress again. In the fourth case, a dentist, 1921, in addition to obtaining goods on false pretences, was shown to have gained access to the Register on a faulty declaration, and his name was erased on this ground. In the fifth case, a dentist, 1921, proved to have aided and abetted his unregistered son to practise dentistry, and to have permitted him to practise in his father's name, was recommended for erasure. In the sixth case, an L.D.S. was proved to have used advertisements on windows, swing signs, and brass plates, in size and quantity greatly in excess of anything required for legitimate professional purposes. The facts alleged having being proved, he was put on probation until November. In the seventh case, a body corporate carrying on the business of dentistry was shown to have advertised, with a view to procuring patients, by means of electric lamps, projecting signs, plates, and boards of a character, size, and wording more than reasonably required to indicate the exact location of the premises. In order not to tie the hands of the new Board judgment was deferred until the next session. In the last case a dentist, 1921, proved to have advertised, with a view to procuring patients, by means of a board 12 feet in length, three electric light-globes painted red, swing signs, show-cases, and other means, was given until November to reconsider his position.

Reciprocity.

A copy of the Dentists Act, 1923, of Barbados was received from the Privy Council, providing that any qualification entitling to registration in the United Kingdom after a course of not less than four years should be recognised for insertion on the Barbados Register. This Act further forbids an unregistered person to practise or do any dental operation for a fee under a penalty of £20 or two months' imprisonment.

Appointment of Committees.

The following Committees were instituted, namely:—

Business Committee: Mr. Brock (Chairman), Mr. Dolamore.
Discipline Committee: The Chairman, Mr. Butterfield, Mr. Gilmour, Sir James Hodsdon, Sir Arthur Chance, Mr. Sheridan.
Educational Grants Committee: Mr. Brock (Chairman), Mr. Robertshaw, Mr. Waring, Mr. Cowan, Mr. Guy, Mr. Sheridan.
Examination Committee: Sir James Hodsdon (Chairman), Mr. Dolamore, Mr. Robertshaw, Mr. Guy, Mr. Sheridan.
Finance Committee: Mr. Waring (Chairman), Mr. Brock, Mr. Dolamore, Sir James Hodsdon, Mr. Stirling.
Registration Committee: The Chairman, Mr. Butterfield, Mr. Gilmour, Mr. Robertshaw, Mr. Cowan, Mr. Stirling.
Research Committee: Mr. Dolamore (Chairman), Mr. Brock, Mr. Gilmour, Mr. Guy, Mr. Sheridan.

The completion was reported of the seal of the Dental Board by Mr. Lessor, which would in future be attached to the formal documents of the Board.

Educational Grants Committee.

It was reported that the Dental School at Belfast had qualified for the grant of £2000; the Edinburgh Dental Hospital for £6000; the Liverpool Dental School for £2400. Birmingham Dental School intimated that for financial reasons the grant of £1500 could not be taken advantage of at present. The decision of Leeds Dental School, where the staff have undertaken to subscribe £2000, was postponed. King's College grant of £700 will be paid against receipts for new equipment. No decision as to grant had been received from the London Hospital Dental School or the National Dental Hospital.

Decision as to the grant of £900 to the Incorporated Dental Hospital of Ireland was adjourned in view of the doubt whether the Free State is now within the jurisdiction of the Dental Board.

The number of students assisted by educational grants or loans up to March 31st, 1924, was 145, of whom 73 had obtained their diploma, 43 were still being assisted, 17 were continuing at their own expense. Of 104 students assisted after the expiration of the Government grants 68 had been enabled to qualify. Of five students in receipt of loans who had qualified one had already commenced repayment by instalments.

Examination Committee.

The fifth and sixth series of prescribed examinations were held in December, 1923, and April, 1924. The December examinations furnished the first opportunity of presenting themselves to persons entered on the list of candidates under the Dentists Act, 1923. At the December examinations there were 28 of these and 53 at the April examinations. There is a total of 633 names on the list of candidates intending to pass the prescribed examinations—namely, 542 dental mechanics, 40 war service candidates, 51 practitioners of 21 years of age.

Attendance at the post-graduate lectures had not been very encouraging, but it was hoped that the institution of a local list of persons on the Dentists Register would enable notices to be sent in future to all dentists resident in the neighbourhood. The average attendances had been, to take one or two examples: Bristol 40, Birmingham 25, Manchester 30, Edinburgh 50. The arrangements for courses of lectures in connexion with the post-registration study, on the other hand, were reported an unqualified success, and there was a general wish that the courses should be repeated next winter, the syllabus to include more practical work and demonstrations with actual patients. The average attendances had been, e.g., Leeds 29, Newcastle 37, Glasgow 65. It was resolved to arrange lectures in the coming session at Birmingham, Cambridge, Cardiff, Manchester, Nottingham, and, if the Board was competent to do so, at Dublin.

Propaganda Committee.

The Board undertook, at the suggestion of the British Broadcasting Company, to provide a lecturer to give one or two talks on dental matters, to be inserted in a programme of talks on other governing factors in public health. The Board of Education was to be invited to receive a deputation from the Board with reference to the institution of suitable instruction in oral hygiene in primary and secondary schools. When the Royal Commission on the National Insurance Acts has been appointed, the Board desires to give evidence as to the need of extending the present provision of dental treatment under the Acts. Authority was given for initial expenditure of a sum not exceeding £50 on the purchase of films bearing on dental subjects for propaganda purposes.

Research Committee.

A confidential report on dental alloys and amalgams was received from Dr. W. Rosenhain, F.R.S., and Prof. E. E. Glynn was granted a sum of £300 to pursue research on the relation between dental sepsis and blood-sugar tolerance, glycosuria, and diabetes.

Free Choice of Dentists.

A memorandum received from the Public Dental Services Association in regard to a circular of the Ministry of Health contained a sentence to the effect that approved societies "do not in all cases allow their members free choice of a dentist." The Board had already written to the Ministry to point out its view that patients had a right to select their own dentists, and that if pressure was put upon patients to seek advice from certain individuals, the practitioners associated with the canvassing body would come under the warning resolution in regard to advertising and canvassing. The Board's view was that if all dentists in a neighbourhood who desired to do so were permitted to enter into arrangements with approved societies, without advertisement of their names, no exception should be taken. Subsequently a letter was received from the Ministry of Health, stating that an approved society would not be entitled out of State Insurance funds to set up and maintain a clinic for dental work, although the case was different for a clinic established by a charitable organisation. The Ministry, however, was considering whether it might not be compelled to give a definite ruling on the extent to which departure from absolute freedom of choice of dentist could be allowed. The letter added that the Ministry hoped to get dental benefit on much better and more systematic lines after the second valuation now proceeding.

At the conclusion of the business Mr. Norman King was reappointed Registrar until Dec. 31st, 1924, and the best thanks of the Board were given to the Chairman for his able services during the present session.

Obituary.

ROBERT KENNEDY, M.A., D.Sc., M.D. GLASG., F.R.F.P.S. GLASG.

BY the death of Robert Kennedy, St. Mungo professor of surgery at Glasgow, the city and University have lost one of their most distinguished professors and science a keen investigator. The loss is the greater as it follows so closely upon the death of other renowned Glasgow surgeons, notably Mr. James H. Nicol, Sir Kennedy Dalziel, and Sir William Macewen.

Robert Kennedy was born in Glasgow in 1865, and received his early education at the High School. He proceeded to Glasgow University, where in 1887 he graduated B.Sc., and the following year M.A. with first-class honours in natural science. In 1889 he became a Doctor of Science, and in 1890 qualified M.B., C.M. with commendation. He took the M.D. with honours, and in 1921 he was admitted F.R.F.P.S. of Glasgow. As a student he won the John Clarke and George A. Clarke scholarship in open competition. Previous to graduation in medicine he was assistant in zoology to the late Prof. John Young, and in botany to Prof. Bower. He also held the post of lecturer in embryology in the University of Glasgow under the Clarke foundation, and lecturer in biology in the Glasgow and West of Scotland Technical College.

In 1890, after graduation, he studied for over a year in the University of Berlin under many of the best known teachers, notably Virchow, Koch, von Bergmann, Olshausen, and Leyden. His study of bacteriology under Koch had, in consequence of the work of Lord Lister, become a necessary preparatory training to the practice of antiseptic and later aseptic surgery. On his return to Glasgow Prof. Kennedy held many important surgical posts. From 1892–96 he was surgeon to out-patients in the Victoria Infirmary until appointed to the surgical staff of the Western Infirmary, where he eventually became visiting surgeon. In the Western Infirmary he was assistant to the late Dr. Patterson for ten years, and was at the same time assistant surgeon in the lock hospital and examiner in surgery at the University of St. Andrews.

In 1906 Kennedy was appointed lecturer in applied anatomy by the Glasgow University Court, and in 1911 the curators of the St. Mungo Chair of Surgery in the University selected him as its first occupant. This selection was inevitable in view of his extensive research in many directions, notably in the surgery of the nervous system. These researches were accepted by the Royal Society of London for publication in their Philosophical Transactions. In 1903 Kennedy's researches were considered of such importance by the French School of Surgery that a translation of them was published in "Chipault's l'Etat actuel de

la Chirurgie Nerveuse." His work included many experiments on the restoration of paralysed muscle by means of nerve anastomosis, and on the restoration of coördinated movements after nerve-crossing with interchange of function of the cerebral cortical centres. He performed extensive investigations into nerve regeneration, and the restoration of coördinated movements after nerve section. Kennedy was a prolific writer; many of his papers were included in the Transactions of the Royal Society of Edinburgh, the Royal Philosophical Society of Glasgow, and in many other medical publications.

Lord Lister, referring to Kennedy's investigations into the regeneration of nerves, said: "The subject is of the highest scientific interest and of very great surgical importance, and it has consequently claimed the attention of distinguished investigators for many years past. It nevertheless remained involved in great obscurity till Dr. Kennedy, availing himself of favourable opportunities which occurred to him as a surgeon, so combined acuteness of observation with sound discriminating judgment as to solve completely, as it appears to me, the difficult problem." Dr. M. Bernhardt, professor of neurology in the University of Berlin, regarded Prof. Kennedy as one of several savants who must be specially reckoned in contributions to the nervous system, and he included Kennedy's work in his book, "Die Erkrankungen der Peripherischen Nerven."

Among his many other researches Kennedy introduced the operative treatment of birth paralysis of the arm, a new method of operation for the radical cure of inguinal hernia, a method for the radical cure of varicose veins, treatment of cicatricial deformities of the hand, exposure of nerves for operations for wry-neck, &c. During the war Prof. Kennedy, as surgeon-in-chief of the Shakespeare Hospital, and later of Bellahouston Hospital in the Ministry of Pensions, did invaluable work among the wounded, involving many hundreds of major surgical operations, including numerous cases of removal of bullets and foreign bodies from the brain.

But for his sudden and unexpected death he would have journeyed this year to Canada as a delegate to the British Association meeting at Toronto. The loss of his son and wife at so short an interval came as a severe blow to him, and no doubt hastened the end. Every sympathy is extended to his only daughter in her great loss.

His friend, Sir J. S. S., sends the following appreciation: "Prof. Kennedy enjoyed the friendship of a wide circle, and was closely identified with the literary life of Glasgow. He took the deepest interest in the abortive movement for the preservation of the Lister Ward in the Royal Infirmary, and was ever at the disposal of his professional brethren, and freely gave them the benefit of his unique experience. He was essentially a scientific surgeon, and he was constantly adding to his knowledge by keeping in touch with other schools and the methods of other specialists at home and abroad. He was intolerant of slip-shod methods, and followed personally the progress of each case, whether it occurred in the public wards of the Royal Infirmary or among his private patients. He disguised under a somewhat brusque exterior a tender and sympathetic heart, and his loss will be mourned by a countless number of patients who came to look upon him as a friend."

DONATIONS AND BEQUESTS.—By the will of the late Mr. Emil Teichmann, of Chislehurst, the testator left among other bequests £2000 to St. Bartholomew's Hospital "in remembrance of my son Oskar's student days"; £500 to the National Institute for the Blind; and £500 to the Chislehurst, Sidcup, and Cray Valley Cottage Hospital.—The late Mr. Frederick Shiers Smith, of Skipton, left by will £500 to the Skipton and District Hospital; £500 to the Leeds Infirmary; £500 for distribution between the Cancer Hospital, Fulham-road, the Middlesex Hospital Cancer Charity, the Gordon Hospital, Vauxhall Bridge-road, and St. Mark's Hospital, City-road.—By will the late Mr. Thomas Murphy, of Chesterfield, among other bequests left £10,000 to the Chesterfield Royal Hospital for a "Murphy Ward," with all necessary provision of staff and other accommodation.

Correspondence.

"Audi alteram partem."

SPINAL-CORD LESIONS IN PEMPHIGUS VULGARIS.

To the Editor of THE LANCET.

SIR,—I have recently examined portions of the central nervous system obtained from a fatal case of pemphigus vulgaris and have found definite pathological changes in the spinal cord. The changes were chiefly those of an invasion of the central canal with mononuclear cells which morphologically resembled fibroblasts. The central canal was presumably occluded in its whole length as the lesions were present to the same extent in all the sections of the cord examined. A few small hæmorrhages were found in the substance of the cord with a slight amount of perivascular, lymphocytic infiltration. No definite lesions were found in the other parts of the central nervous system examined. Efforts to transmit the disease to animals have, up to the present, not met with success, but the material used for the inoculations was glycerinated as no special precautions had been taken to collect it in a sterile manner. One animal only showed a transient weakness of one of the forelimbs, and appeared to be ill for a few days; recovery seems, however, to have been complete.

I am, Sir, yours faithfully,

C. C. TWORT, M.D. Aberd.

Pathological Dept., St. Bartholomew's Hospital, June 6th, 1924.

"INDUCTION" OR "CAUSE" OF CANCER.

To the Editor of THE LANCET.

SIR,—Sir Lenthal Cheatle is grieved because some of us have failed to realise that "the factors that induce carcinoma belong to quite a different category from those that cause it." He repeats this four times, in different words, in the course of his short letter. What we have said is that the agents with which we have induced cancer experimentally are the prime, proximate, or inciting causal agents as distinguished from secondary, mediate, or contributory causes, as far as the particular results are concerned. If we have sinned in confusing the words "induce" and "cause" we have done so in goodly company. Webster's dictionary, for example, gives as one of the meanings of "induce" "to cause."

If Sir Lenthal Cheatle, for whom and for whose contributions to the study of cancer I have a profound respect, would be so good as to give us half a dozen examples of diseases that can be *induced* by something which does not *cause* them, I will truly seek repentance and renounce my allegiance to the lexicographers.

I am, Sir, yours faithfully,

ARCHIBALD LEITCH.

The Cancer Hospital Research Institute, Fulham-road, London, S.W. 3, June 7th, 1924.

TOXIC EFFECTS OF LOCAL ANÆSTHESIA.

To the Editor of THE LANCET.

SIR,—If Dr. P. Watson-Williams will turn again to my letter he will see that my reference to the advisability of always combining adrenalin with cocaine is preceded by the words: "It may, I think," whereby I intended to convey the impression that it was a suggestion I was making, rather than a rigid generalisation, the perils of which I am well aware of. For the point is, I know, one for debate. No one will, perhaps, quarrel with the dictum that, as a rule, and particularly in extensive anæsthetisations, adrenalin should always accompany cocaine. In the matter of light anæsthesia of the nose, however, as for examination purposes, the question is, as Dr. Watson-Williams quite correctly implies, not by any

means so simple. In light sprays, adrenalin frequently sets up an annoying reaction, with sneezing and running at the nose, which I have known to last as long as 48 hours, and to be a cause of much bad language, directed, and with perfect justice, to the rhinologist's address. But, on the other hand, I have occasionally seen cocaine syncope follow even a trivial spraying of the nose with pure cocaine solution; the drug is then so rapidly and completely absorbed.

So there the problem stands, and each man must solve it for himself. Personally, I prefer a swearing patient to a fainting patient. But I am quite ready to admit that others may cherish the opposite opinion. May I add that syringing the nose with warm saline solution after adrenalin-cocaine spraying can, as a rule, but not always, be relied upon to avert any subsequent irritation. It is curious that so violent a reaction seldom follows the more continued anæsthetic applications needed for operation.

I am, Sir, yours faithfully,

DAN MCKENZIE.

Wimpole-street, Cavendish-square, W., June 6th, 1924.

GASTRIC AND DUODENAL HÆMORRHAGE.

To the Editor of THE LANCET.

SIR,—Dr. A. C. Jordan's comments on Dr. A. F. Hurst's valuable communication on this subject merit a passing comment. Dr. Jordan's commentary on the relationship of gastric and duodenal disorder to primary disease in the ileo-cæcal region is, in my opinion, well founded, as is also his recommendation in regard to the use of enemata as an essential part of the treatment. Perhaps one reason why progress is made so slowly in unravelling the mystery of disease is the present classification of disease and the too restricted outlook arising from it. It is, I think, doubtful whether simple gastric or duodenal ulcer ever occur as primary conditions. Apart from the measures which are necessary in an emergency, treatment should be mainly directed to the primary defect in the ileo-cæcal region and colon. If the suggestions as to ætiology and treatment in Dr. Hurst's communication are considered along with the facts brought out in Dr. Jordan's letter, and investigations made continually by the light of that teaching, our knowledge of the ætiology and treatment of gastric and duodenal ulcers would, before long, be on a much higher plane than at the present time.

I am, Sir, yours faithfully,

CHALMERS WATSON, M.D.

Edinburgh, June 6th, 1924.

THE PSYCHOLOGY OF SEA-SICKNESS.

To the Editor of THE LANCET.

SIR,—May I answer the questions of F.R.C.S. in your issue of May 31st in reverse order? In my opinion sea-sickness is always of psychical origin and this appears to be a widely accepted impression, seeing that all medicines recommended for the malady come under the category of nervous sedatives, while other remedies, such as looking in a mirror, are obviously for the purpose of auto-suggestion. I am fortunately able to answer his other question from psycho-analytical experience of patients. Even exclusively artificial feeding does not necessarily render a child immune from sea-sickness. One of my patients (an obsessional case), who is still undergoing psycho-analysis, chanced to work through a phantasy of feeding in his mother's arms and thus incidentally cured himself from being a very bad sailor indeed; yet he knew from information received that he had been "brought up on the bottle." He explained that he might well be nursed against his mother's breast while feeding from a bottle.

The situation is, however, not quite so simple. The essential factor for the development of excessive oral libido is over-stimulation of the mouth during infancy, perhaps by "dummies," the nurse's finger, and the child's own thumb, as well as the mother's breast; while the associated rhythmical respiratory heaving motion during feeding is too often supplemented or replaced by jigging the child to and fro or up and down, cradle-rocking, swinging, and so forth. The fact that F.R.C.S. and his son are good sailors may probably be ascribed to their nurses refraining from undue oral stimulation, or from abnormal rocking movements, or both.

I hope that it is unnecessary to add that this explanation of sea-sickness will never cure a patient suffering from it. To be effective, he must discover the explanation for himself, out of his own mind. Otherwise he will simply refuse to believe it, as indeed will most of your readers unfamiliar with psycho-analytical investigations.

I am, Sir, yours faithfully,

W. H. B. STODDART.

Cavendish-square, W., June 6th, 1924.

ROCKEFELLER ENDOWMENTS AT HONG-KONG.

To the Editor of THE LANCET.

SIR,—In your issue of March 1st (p. 465) it is stated that the Rockefeller Foundation allocated the sum of $250,000 to the Hong-Kong University for the chairs of medicine and surgery. Will you permit me to make the following corrections? On May 24th, 1922, the Foundation appropriated the sum of $500,000 for the endowment of the chairs of medicine and surgery. More recently, on Feb. 5th, 1924, the Rockefeller Foundation generously appropriated a further sum of $250,000 for a chair of obstetrics and gynæcology. The Hong-Kong University was founded in March, 1911, and opened in 1912 as a residential University for students of both sexes of all races, nationalities, and creeds, not as stated in your note for British subjects only.

I am, Sir, yours faithfully,

KENELM H. DIGBY,

Dean, Faculty of Medicine, University of Hong-Kong.

April 23rd, 1924.

THE KASR-EL-AINY HOSPITAL AT CAIRO.

To the Editor of THE LANCET.

SIR,—You are, I believe, wrong in thinking that the King of Egypt has opposed the project of building a new hospital and centre of medical education in Cairo. King Foad has always encouraged anything likely to benefit his country. The project has been discarded for the present by the advice of a special committee held to report on that subject. It may please you to learn that the King of Egypt has recently ordered the purchase of a tuberculosis sanatorium of 360 beds at Helouan, originally built by Baron Kioppe on the most modern lines. This sanatorium will shortly be ready to receive patients, pulmonary and otherwise, who will have an exceptional opportunity of cure or relief by heliotherapy.

I am, Sir, yours faithfully,

Cambridge, June 6th, 1924. I. YOUSRY, M.D.

DOMINIONS MEDICAL HOSPITALITY.

To the Editor of THE LANCET.

SIR,—You printed last week a programme of the arrangements made by my committee for the entertainment of overseas visitors. Certain forms have been returned to me unsigned, making it impossible to comply with the wishes expressed on them. May I through your columns appeal for the names and addresses of the writers?

I am, Sir, yours faithfully,

A. E. MORTIMER WOOLF,

Hon. Secretary, Dominions Medical Hospitality Committee.

94, Harley-street, London, W., June 10th, 1924.

LEAD AND CANCER.

To the Editor of THE LANCET.

SIR,—The annotation under the above title on p. 1164 in your issue of June 7th, dealing with Prof. Blair Bell's address which appears in the current issue of *Public Health*, induces me to draw attention to the following information drawn from Table V. of the Supplement to the Seventy-Fifth Annual Report of the Registrar-General, Part 4.

Comparative Mortality Figures.

Group.	1910–12.		1900–02.	
	Cancer.	Lead.	Cancer.	Lead.
Lead manufacturers	80	123	81	102
Potters	80	22	74	10
Plumbers, painters	87	20	73	23
File-makers	78	10	57	56
Copper manufacturers	71	6	45	3
Gunsmiths	78	4	74	—
Printers	68	2	65	2
Glass-makers	81	2	71	8
Chemical manufacturers	71	—	85	3
Occupied and retired males	78	1	68	1
Clergy	45	—	48	—
Coal-miners	61	—	53	—
Shipbuilding	64	—	55	—
Slaters, tilers	117	—	71	—
Furriers, skinners	82	—	115	—

Here are stated for two decennial periods all occupational groups with comparative mortality figures from lead poisoning above the standard set by occupied and retired males. Out of nine groups, in 1900–02 only two were markedly low for cancer, while two were markedly high; in 1910–12 only one group, printers, is rather low, and only one, plumbers, is high. A few other groups with no cases of lead poisoning are also given in order to show that lower and higher cancer figures, with more pronounced variations in rise or fall, are to be found in other occupations than the "lead" occupations.

These data do not reveal the suggested connexion between cancer and lead poisoning.

I am, Sir, yours faithfully,

EDGAR L. COLLIS.

Welsh National School of Medicine, Cardiff,
June 10th, 1924.

Parliamentary Intelligence.

HOUSE OF COMMONS.

WHITSUNTIDE ADJOURNMENT.

ON June 6th the House of Commons adjourned for the Whitsuntide recess until Monday, June 16th.

THE HOUSING PROPOSALS.

On June 3rd the House went into Committee on the money resolution on which to found the Housing (Financial Provisions) Bill, Mr. R. YOUNG, Chairman of Committees, in the chair.

Mr. CLYNES, Lord Privy Seal, formally moved the following resolution:—

That it is expedient—

(*a*) To authorise the payment, out of moneys provided by Parliament, of contributions towards the expenses incurred in connexion with the provision of houses of the type and size mentioned in Subsection (2) of Section 1 of the Housing, &c., Act, 1923, which are completed before the first day of October, 1939, not exceeding in the case of any house which is subject to special conditions, whether as regards rent or lettings or disposal or otherwise, a sum of £9, or (if the house is situated in an agricultural parish in England or Wales, or in a rural area in Scotland) a sum of £12 10*s.*, payable annually for a period not exceeding 40 years, and in the case of any house which is not subject to such special conditions a sum of £6, payable annually for a period not exceeding 20 years; and

(*b*) To make provision as to such special conditions and, in the case of houses which are subject to special conditions, to provide for the reduction or variation of the contributions in the event of any of the special conditions not being complied with; and

(*c*) To make provision for the withholding of contributions or the reduction or variation of contributions except in the case of houses completed before certain dates; and

(*d*) To make provision for the amendment of the financial provisions of the Housing, &c., Act, 1923, and for other purposes incidental thereto or connected therewith.

Mr. WHEATLEY, Minister of Health, in explaining the Government's housing proposals, claimed that the Act of 1923 had been a complete failure. Something like 100,000 new houses per annum would be required to prevent the housing shortage increasing. On May 1st of this year 4645 houses had been completed and 12,738 were under construction, making a total of 17,383 either completed or under construction by local authorities for the purpose of letting. Assuming that all the houses were completed by Oct. 1st, the fact would remain that the housing conditions of the people who lived under the worst conditions in this country were considerably worse than when the present Act was introduced about 12 months ago. Not a single one, so far as he could ascertain, of the 32,000 houses being erected by what was called private enterprise was for the purpose of letting to the people who were so much in need of houses. His scheme, so far as the building industry was concerned, would work automatically. At the end of three years' building they would take stock, and if the average output of houses agreed upon between the State and the industry was not maintained then the agreement automatically terminated. On the other hand, if the output of houses was maintained the agreement automatically proceeded for a further period and they took stock again, and so on to the end of the 15-year period, when they would have produced 2,500,000 houses. The building industry had pointed out to him that they could not continue to give houses at present prices unless the prices of materials were maintained at their present level. That seemed perfectly reasonable. He had drafted a Bill by which he would ask Parliament to give him drastic powers for dealing with profiteering in building materials. The brick manufacturers had intimated that they were prepared to take the price of January, 1924, as the basis of the price for future building under his scheme. They were also prepared to see it enacted in an Act of Parliament that it should be an offence or the basis of investigation of an offence that a price was charged by any manufacturer higher than that charged in January, 1924, unless they could prove that the increase was justified by reason of increased wages or similar cause. He did not think that the nation could get a more generous offer. It was further proposed to set up three committees. One would be composed of builders and operatives, another of manufacturers of materials and merchants, and the third was a prices survey committee. These three committees would be interlocked by three representatives of each sitting on a super-committee, a national building committee to be set up by the Ministry of Health. There would be no representatives of the local authorities or the State on these committees because they would act simply in an advisory capacity. The subsidy for which he asked the sanction of Parliament was £9 a house per annum for 40 years and in defined agricultural areas of £12 10*s.* per house per annum. The amount of the subsidy was to be revised every three years, not for the houses that had been built, but in the light of existing circumstances for the houses of the future. In one respect he was sorry that he had to yield to the local authorities. They insisted that he would not interfere with the size of houses laid down in the 1923 Act. He would have liked to add 100 ft. to the maximum. He found that within their discretion, which was from 550 ft. to 950 ft., the average size of houses being built by local authorities in England and Wales was 817 ft.

The House went into Committee on June 4th and resumed the discussion of the money resolution on which to found the Housing (Financial Provisions) Bill.

During the course of the discussion Mr. WHEATLEY accepted an important amendment, moved by Sir G. MCCRAE, the Liberal Member for Stirling and Falkirk, to paragraph (*c*) of the resolution providing, in the absence of adequate arrangements, for the necessary increase in the supply of labour and materials at reasonable prices, for the withholding of the subsidy, or the reduction or variation of the subsidy except in the case of houses complete before a certain date.

The resolution as amended was agreed to.

Housing Bill Introduced.

On June 5th the House considered the money resolution in connexion with the Government's Housing Bill, which was agreed to in Committee with an amendment on the previous day.

Mr. WHEATLEY moved an amendment which he said arose out of the amendment agreed to on the previous night. If they were to proceed with the resolution as it stood, it would exclude certain contingencies under which they would want to suspend the operations of the Act. He had submitted the words he proposed to move both to the mover of the amendment (Sir G. McCrae) and to Mr. Neville Chamberlain. His amendment was to insert in paragraph (*c*), after the words "to make provision in," the following words: "Certain contingencies including contingencies which may arise in." The effect, he said, was not to confine the powers of the Government to the shortage of labour and materials, but to leave them in the wider sense while including the amendment carried on the previous night.

The amendment was agreed to and the resolution as amended was agreed to.

Mr. Wheatley then, amid cheers, brought in the Housing (Financial Provisions) Bill, which was read a first time.

WEDNESDAY, JUNE 4TH.

Cost of Health Insurance Central Administration.

Mr. TREVELYAN THOMSON asked the Minister of Health what was the cost of the central administration of National Health Insurance benefits for insured persons—i.e., by the Ministry of Health, the Welsh Board of Health, and the Scottish Board of Health respectively.—Mr. WHEATLEY replied. The approximate total cost of the central administration of National Health Insurance (including expenses incurred by other Government departments and certain amounts recoverable from insurance funds) in the year 1923 was as follows:—England: Ministry of Health, £871,000; Wales: Welsh Board of Health, £70,000; Scotland: Scottish Board of Health, £123,000.

Subsidised Midwives for Rural Areas.

Mr. BLACK asked the Minister of Health whether, in the interest of the preservation of the lives of mothers and new-born babies, he would make it a statutory obligation upon county councils to provide a sufficient service of subsidised midwives to cover the necessities of the whole of the rural areas of Great Britain.—Mr. WHEATLEY replied: I could not undertake to introduce legislation for this purpose at the present time. The large majority of county councils are already exercising their present powers by aiding the provision of midwives in rural areas, and I am willing to consider any proposals for additional assistance in this direction. I propose shortly to issue a circular calling attention to the necessity for an efficient midwifery service in every area.

Sanatoriums for Advanced Consumption Cases.

Mr. BLACK asked the Minister of Health how many sanatoriums for the reception of incurable and dying cases of tuberculosis there were in Great Britain and what proportion of such cases died away from public institutions of this character.—Mr. WHEATLEY replied: Of the institutions which I have approved for the treatment of tuberculosis in England and Wales, 99 are available wholly or mainly for the reception of advanced cases of the disease. The majority of the remaining institutions, other than children's institutions, also admit a proportion of advanced cases. As regards Scotland, a question should be addressed to the Senior Secretary for Health for Scotland. I cannot say what proportion of deaths from tuberculosis occur elsewhere than in approved sanatoriums, but in 1922 approximately two-thirds of the total deaths from tuberculosis in England and Wales occurred elsewhere than in institutions.

Ex-Service Men and Tuberculosis.

Mr. PIELOU asked the Minister of Health the number of ex-Service men who had died during the last nine years from tuberculosis as a result of their war service.—Mr. F. O. ROBERTS replied: The number of ex-Service men who have received an award from the Ministry of Pensions in respect of tuberculosis and who have died from that disease is, I regret to say, 15,770.

THURSDAY, JUNE 5TH.

Births and Deaths Registration Bill.

Lieut.-Colonel FREMANTLE introduced the Births and Deaths Registration Bill, a measure to amend the law relating to certification of still-births and deaths and the disposal of the dead. The Bill, which is supported by a doctor and a lawyer from each political party, was read a first time.

Examination of Young Persons for Factory Work.

Mr. GRAHAM WHITE asked the Home Secretary if it was his intention to raise the age of examination of young persons for factory employment from 16 to 18 in order to link up the inspections under the Factory Act with that of the school medical services and other public health services.—Mr. HENDERSON replied: I have decided, after consultation with the Ministry of Health, to include in the Factories Bill the recommendation in favour of raising the age which has been made by the Departmental Committee presided over by my hon. friend the Parliamentary Under-Secretary of State for the Home Office. The hon. Member will find the provision in Clause 91 of the Bill.

Danger to Health of Pneumatic Tools.

Mr. BENJAMIN SMITH asked the Home Secretary whether his attention had been called to the injury to health suffered by men using pneumatic tools; and whether he would cause an inquiry to be held into the matter.—Mr. HENDERSON replied: I received recently a communication on this subject from the Transport and General Workers' Union, but no definite evidence of injury has so far been furnished. I will have the matter looked into, but I shall be glad if the hon. Member can supply me with particulars of actual instances of workmen who have suffered injury to health from this cause with a view to facilitate inquiry.

Children and Poor-law Relief.

Mr. GRAHAM WHITE asked the Minister of Health if he would give, as on the last convenient date, the number of children who were in receipt of Poor-law relief owing to the unemployment of their parents.—Mr. GREENWOOD replied: The number of children under 16 years of age in England and Wales dependent upon parents who were in receipt of Poor-law relief on account of unemployment was about 250,000 in March of this year.

Nursing Service in Mental Hospitals.

Mr. HORE-BELISHA asked the Minister of Health whether the Departmental Committee on the Nursing Service in Mental Hospitals had yet reported; and, if so, whether the report would be published.—Mr. GREENWOOD replied: The report is nearing completion and will be published as early as possible.

Mr. BUCKLE asked the Minister of Health whether, in the case of the additional London County Council asylum about to be opened in the neighbourhood of Epsom under the name of West Park Mental Hospital, he would say whether it was intended for the care and treatment of certified patients; what accommodation it would afford; and whether voluntary boarders were to be admitted.—Mr. GREENWOOD replied: The answer to the first part of the question is in the affirmative. The institution will provide accommodation for 1732 patients. My right hon. friend regrets that the law does not allow voluntary boarders to be admitted for treatment in public mental hospitals.

Physical Condition of Army Recruits.

Mr. THURTLE asked the Secretary of State for War whether he was aware that, in the year 1921–22, out of 106,954 persons offering to enlist, 59,736, or 56 per cent., were rejected for physical reasons, whilst in the year 1912–13 only 2·7 per cent. were so rejected; and whether he could give any reasons for the difference.—Mr. S. WALSH replied: The percentages of rejection are 56 per cent. and 27 per cent., not 2·7 per cent. The higher percentage of rejection in the later year is no doubt the effect of war conditions upon the physique of the population, but I am glad to say that the quality of the recruits now coming forward is steadily improving.

FRIDAY, JUNE 6TH.

Departmental Committee on Health Insurance.

Sir JOHN MARRIOTT asked the Minister of Health whether the Inter-Departmental Committee on Health and Unemployment Insurance (1922) was still in being; whether that Committee had presented any reports since that dated March 17th, 1922; whether any further or final report from the Committee might be expected, and, if so, when.—Mr. GREENWOOD (Parliamentary Secretary Ministry of Health) replied: The answer to the first part of the question is Yes. The Committee presented a third interim report on Feb. 23rd, 1923. No further report has been prepared and it is doubtful whether the Committee can profitably resume its deliberations having regard to the fact that a Royal Commission is about to be appointed to investigate the working of the system of health insurance, and that modifications of the Unemployment Insurance Scheme are also under consideration.

Medical News.

UNIVERSITY OF CAMBRIDGE.—It was announced by the Vice-Chancellor on June 10th that Sir Jeremiah Colman had given £2000 to establish a library for the School of Biochemistry.

UNIVERSITY OF OXFORD.—The following candidates passed in the recent examination:—

Diploma in Public Health.—Part I.: Capt. T. O. Thompson, D.M., St. John's College. Part II.: J. G. Johnstone, B.M., and Capt. T. O. Thompson, D.M., St. John's College.

In Convocation on June 3rd the reappointment was approved of Dr. E. W. Ainley Walker, Fellow of University College, as Dean of the Medical School. In congregation, on the motion of Regius Professor of Medicine, Sir Archibald Garrod, a proposal was accepted to lend £4000 from the Special Reserve Fund to extend the Department of Human Anatomy in order to house the Rolleston collection of crania and skeletons and to provide suitable laboratories for the instruction of students in physical anthropology.

UNIVERSITY OF LONDON.—In the Final Examination for the degree of M.B., B.S., held last month, the honours list is as follows:—

Kathleen D. Arnsby (*b*), London (R.F.H.) School of Medicine for Women; E. Gallop (*a*, *e*), St. Bartholomew's Hospital;

Dorothy Gibson (*a*, *d*, University Medal), London Hospital; W. O. C. Jarratt (*d*), St. Thomas's Hospital; J. Maxwell (*a*, *e*), St. Bartholomew's Hospital; A. T. Rogers (*d*), Guy's Hospital; W. P. H. Sheldon (*a*), King's College Hospital; Hilda N. Stoessiger (*b*), London (R.F.H.) School of Medicine for Women; T. C. Summers (*d*), London Hospital; H. F. Walker (*e*), Middlesex Hospital.

(*a*) Distinguished in Medicine. (*b*) Distinguished in Pathology. (*d*) Distinguished in Surgery. (*e*) Distinguished in Midwifery.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—The Croonian lectures will be given by Sir Leonard Rogers on June 17th, 19th, 24th, and 26th, the subject being Researches on Leprosy and their Bearing on the Treatment of Tuberculosis. The Bradshaw lecture will be given by Dr. F. John Poynton on Nov. 4th on the Prevention of Acute Rheumatism. The Mitchell lecture will be given by Sir StClair Thomson on Nov. 6th on Tuberculosis of the Larynx, and its Significance to the Physician. The FitzPatrick lectures will be given by Dr. Charles Singer on Nov. 11th and 13th on the History of Anatomy. The above lectures will be delivered at the College, Pall Mall East, at 5 P.M. The Lloyd-Roberts lecture will be delivered at the Medical Society of London, 11, Chandos-street, W., by Dr. Herbert R. Spencer, on Nov. 19th, on the Renaissance of Midwifery.

CONFERENCE ON INFANT WELFARE.—The Third English-speaking Conference on Infant Welfare will be held at Caxton Hall, Westminster, on July 1st to 4th, under the auspices of the National Association for the Prevention of Infant Mortality and the National Baby Week Council.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—It has been arranged to hold in July a two weeks' course in ophthalmology (July 7th to July 18th) at the Royal Eye Hospital, Southwark. The ground covered will include clinical cases, followed by a lecture on subjects of particular interest to those engaged in the study of ophthalmology. Also a fortnight's intensive course (July 21st to August 2nd), including all the special and general departments of medicine and surgery at the North-East London Post-Graduate College (Prince of Wales's General Hospital, Tottenham). There will be the following courses in August: Diseases of children at the Queen's Hospital for Children; diseases of the chest at the Brompton Hospital (both courses date from August 11th to August 23rd) and neurology at the West End Hospital for Nervous Diseases (August 18th to Sept. 6th). Copies of the syllabus of the above courses with full particulars can be obtained from the Secretary, Fellowship of Medicine, 1, Wimpole-street, W.1.

LONDON HOSPITAL.—On June 4th a framed testimonial, a gift of the Carnegie Hero Fund, was presented by Lord Knutsford to Mr. Ernest Harnack in recognition of his work in connexion with the X ray department. Mr. Harnack entered the radiographic department in 1897, and in carrying out his pioneer work he lost both his arms. In these early days the opacity of lead glass to X rays was not known. Mr. Harnack also received a grant of £75 a year from the Carnegie Hero Fund, in addition to the £285 a year given by the hospital. At the same meeting Lord Knutsford announced that a special department for sunbath treatment for general tuberculosis was to be erected; he also stated that Sir H. M. Mallaby-Deeley, in place of his original offer of £10,000, had offered a further £15,000 under certain conditions for the massage department. It was also stated that a special research department was being organised under Dr. George Riddoch, assisted by Dr. Henry Head.

THE MINISTER OF PENSIONS IN IRELAND.—Our Irish correspondent writes:—Mr. F. O. Roberts, British Minister for Pensions, accompanied by Mr. J. W. Muir, Parliamentary Secretary, has been paying a visit to Ireland, south and north, during the Whitsuntide recess. In his speech to a gathering of ex-Service men Mr. Roberts stated that there was something wrong with the work of the Ministry when, in so high a proportion as 60 per cent., appeals to the Pensions Appeals Tribunal were successful. Mr. Muir, in reply to criticisms concerning medical boards, said that the Ministry wished it to be understood that they did not want medical men to make their assessments from any point of view of economy, or any other point of view than the merits of the cases. They wanted every medical board to act independently of any other medical board in the country, and not to consider how its average of assessments would compare with the average of any other board. In cases where there was any doubt, they wanted the benefit of the doubt to be given to the men, and they wanted that to be understood by all their officers. If, however, the Ministry does not wish for any approximation to the average in the work of individual boards and areas, it is not easy to see why the central office is so assiduous in drawing the attention of local administrators to variations from the average. Mr. Roberts visited the Ministry's Orthopædic Centre at Blackrock, and paid a high compliment to the surgical work performed there.

Dr. R. A. Lyster, county medical officer of health for Hampshire, has been elected President of the Society of Medical Officers of Health for the session 1924-25.

EUGENICS EDUCATION SOCIETY.—To-day (Friday), at 3 P.M., Dr. W. A. Potts, of Birmingham, will open a conference on the Desirability of Greatly Increased Institutional Accommodation for Mental Defectives, to be held at the rooms of the Royal Society, Burlington House, Piccadilly, London; Major Leonard Darwin, Sc.D., will be in the chair. Members of the society and all interested are invited to attend.

ORDER OF THE HOSPITAL OF ST. JOHN OF JERUSALEM.—The following members of the medical profession have received promotion in the Order: Serjeant-Surgeon Sir Richard Havelock Charles to be Knight of Justice; Lieut.-Colonel G. H. L. Hammerton, R.A.M.C. (T.F.), Sir Robert W. Philip, Lieut.-Colonel G. Horne, and Colonel Sir Thomas Oliver to be Knights of Grace; Dr. S. M. Hebblethwaite, Surgeon Lieut.-Colonel J. H. Hacking, Surg.-Commander G. O. M. Dickenson, R.N., Dr. A. S. Allan, Dr. A. D. Cameron, Lieut.-Colonel H. Ross, I.M.S., and Colonel Sir Edward N. Thornton are appointed Esquires.

UNIVERSITY OF DURHAM MEDICAL GRADUATES ASSOCIATION.—The annual general meeting will be held on Thursday, June 26th, at 4.30 P.M., at the rooms of the Medical Society, 11, Chandos-street, Cavendish-square, London, W. Following the ordinary business of the meeting Dr. G. de B. Turtle will read a short paper entitled An Attempt to Classify Certain Types of Pyrexia. A small informal dinner will be held the same evening at the Criterion Restaurant, Piccadilly-circus, at 7.45 (price of the tickets 10*s.* 6*d.*, exclusive of wines, which sum will be collected at the table). Any member wishing to attend will greatly facilitate the work of Dr. F. W. M. Pratt, the secretary, 15, Clarges-street, Mayfair, W. 1, by replying before June 16th.

ROYAL COLLEGE OF SURGEONS IN IRELAND.—The election of President, Vice-President, and Council and Secretary of the Royal College of Surgeons in Ireland was held on June 2nd. The following were elected:—President: Mr. Richard C. B. Maunsell. Vice-President: Mr. Andrew Fullerton. Secretary of College: Sir Frederick C. Dwyer. Council: John B. Story, Sir Thomas Myles, Major-General R. H. S. Sawyer, Arthur W. W. Baker, Sir Arthur Chance, Sir Robert H. Woods, Richard Lane Joynt, Thomas Eagleson Gordon, Sir Frederick C. Dwyer, Alexander J. Blayney, Sir William Taylor, Trevor Nathaniel Smith, Seton Pringle, Sir William I. de Courcy Wheeler, Sir C. Arthur K. Ball, Richard Atkinson Stoney, Edward Sheridan, William Pearson, Adams A. McConnell. Mr. Maunsell is a graduate in medicine and surgery of the University of Dublin, and for several years held the position of University examiner in surgery. He has been a Fellow of the Royal College of Surgeons since 1900, and was elected to the council in 1904. Two years ago he was unanimously elected to the position of vice-president. Mr. Maunsell is the senior surgeon to Mercer's Hospital, having been appointed to the staff of that hospital in 1898, and lectures and writes on surgical subjects. During the war Mr. Maunsell for a time served in France as surgical specialist to the Dublin 83rd General Hospital.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Tuesday, June 17th.

SPECIAL GENERAL MEETING OF FELLOWS: at 5 P.M.
To be followed immediately by a
GENERAL MEETING OF FELLOWS:
Ballot for election to the Fellowship.

Thursday, June 19th.

DERMATOLOGY: at 5 P.M. (Cases at 4 P.M.)
Cases:
Dr. G. Pernet: (1) Porokeratosis; (2) Extensive Dermatitis Factitia.
Other cases will be shown.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 11, Chandos-street, W.

THURSDAY, June 19th.—8.15 P.M., Annual General Meeting, preceded by a Demonstration at 7.45 of Leishmania and Other Allied Flagellates.

The paper, illustrated by lantern slides, will be read by Lieut.-Colonel T. McCombie Young, I.M.S., on Fourteen Years' Experience with Kala-Azar Work in Assam.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W. 1.

MONDAY, June 16th, to SATURDAY, June 21st.—CHELSEA HOSPITAL. Daily Operations, &c. Mon., 2 P.M., Mr. L. C. Rivett: Lecture Dem., Procidentia. Tues., 2 P.M., Mr. Victor Bonney: Dysmenorrhœa. Wed., 2 P.M., Mr. Stanley Dodd: Extra-Uterine Gestation. Sat., 11 A.M., Mr. Aubrey Goodwin: Path. Dem.—CHILDREN'S CLINIC. Mon., 2 P.M., Dem. of Cases. 2.30 P.M., Mr. Winsbury White: Stone in Children. 4 P.M., Prof. Lovatt Evans: Acidosis. At College Farm, Finchley, Tues., 2.30 P.M., The Production of Certified Milk on a Model Farm. 3.30 P.M., Dr. Bernard Myers: The Feeding of Infants and Older Children. At Children's Clinic, Thurs., 10 A.M., Dem. of Cases. 11.30 A.M., Dr. T. Joekes: The Blood Diseases of Children.—LONDON SCHOOL OF TROPICAL MEDICINE. Tuesdays and Thursdays at 2 P.M., Demonstrations on Diseases of Tropical Countries.—ROYAL NORTHERN HOSPITAL, in conjunction with the Royal Chest Hospital, City-road. Special Course in Intensive Medicine and Surgery (first week).—ST. PETER'S HOSPITAL FOR STONE. Clinical work and special Lectures daily (first week).

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, June 16th.—12 noon, Mr. Simmonds: Demonstration of Fractures. 2 P.M., Dr. Scott Pinchin: Medical Out-patients. 2 P.M., Mr. Bishop Harman: Eye Dept.

TUESDAY.—11 A.M., Dr. McDougal: Electrical Dept. 12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. Sinclair: Surgical Out-patients.

WEDNESDAY.—12.15 P.M., Dr. Burnford: Medical Pathology. 2 P.M., Dr. Owen: Medical Out-patients. 2 P.M., Dr. Pernet: Skin Dept.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 12 noon, Dr. Scott Pinchin: Diseases of Heart. 2 P.M., Mr. MacDonald: Genito-Urinary Dept.

FRIDAY.—10 A.M., Mr. Dudley Buxton: Dental Dept. 12 noon, Surgical Registrar: Surgical Pathology. 2 P.M., Mr. Vlasto: Throat, Nose, and Ear Dept.

SATURDAY.—9.30 A.M., Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. Mr. Banks-Davis: Operations on Throat, Nose, and Ear.

Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, Queen-square, Bloomsbury, W.C. 1.

POST-GRADUATE COURSE.

MONDAY, June 16th.—12 noon, Dr. Riddoch. Lecture: Anatomy and Physiology of Nervous System. 2 P.M., Dr. Hinds Howell: Out-patient Clinic. 3.30 P.M., Dr. Birley. Lecture: Subacute Combined Degeneration of the Cord.

TUESDAY, June 17th.—12 noon, Dr. Greenfield. Lecture: Cellular Reaction in Nervous System. 2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Risien Russell. Lecture: Myasthenia Gravis.

THURSDAY, June 19th.—12 noon, Dr. Riddoch. Lecture: Anatomy and Physiology of Nervous System. 2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. Gordon Holmes: Syphilis of Nervous System.

FRIDAY, June 20th.—2 P.M., Dr. Gordon Holmes: Out-patient Clinic. 3.30 P.M., Mr. Elmquist: Demonstration of Physical Exercises.

Applications should be addressed to the Secretary, Medical School, National Hospital for the Paralysed and Epileptic, Queen-square, London, W.C. 1.

J. G. GREENFIELD, Dean.

ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN.

TUESDAY, June 17th.—5 P.M., Dr. Knowsley Sibley: Electro-Therapeutics.

THURSDAY.—5 P.M., Dr. Griffith: Primary Lesion of Syphilis.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL.

THURSDAY, June 19th.—5 P.M., Mr. Richard Lake: Middle-Ear Disease. (Geoffrey E. Duveen Lectures in Otology).

UNIVERSITY OF LIVERPOOL POST-GRADUATE LECTURES (3.30 P.M.)

MONDAY, June 16th.—(At the Shaw-street Hospital.) Mr. Leyland Robinson: The Fibroid Uterus.

TUESDAY.—(At the Maternity Hospital.) Miss Nicholson: Syphilis, Antenatal and Postnatal.

WEDNESDAY.—(At the St. Paul's Eye Hospital.) Mr. H. Haward Bywater: Some Clinical Cases.

THURSDAY.—(At the St. George's Hospital.) Dr. F. H. Barendt: Skin Cases.

FRIDAY.—(At the Eye and Ear Infirmary.)

Appointments.

CUMMING, J. K., M.B., Ch.B. Aberd., has been appointed Medical Officer of Health, Great Harwood.

GIFFEN, T. M., F.R.C.S. Edin., L.R.C.P. Edin., to be one of the Medical Referees under the Workmen's Compensation Act for the Districts of Birkenhead and Runcorn County Courts.

GILLIES, P. H., M.B., C.M. Edin., County Medical Officer for Argyll.

Westminster Hospital: PRICE, THOMAS C., F.R.C.S. Eng., Surgical Registrar; LLOYD, W. E., M.B. Lond., M.R.C.P. Lond., Medical Registrar.

Vacancies.

For further information refer to the advertisement columns.

Alton, Hampshire, Lord Mayor Treloar Cripples' Hospital and College.—Jun. Asst. R.M.O. £250.

Bahamas.—Bacteriologist and Asst. M.O.H. £600.

Barbados General Hospital.—Res. S. £330.

Barnsley, Beckett Hospital and Dispensary.—Sen. H.S. £220.

Buxton, Derbyshire, Devonshire Hospital.—Asst. H.P. £150.

Cardiff, Welsh National School of Medicine.—Lecturer in Special Sense Physiology. £750.

Dreadnought Hosp., Greenwich, S.E.—H.S. and H.P. Each £150.

Dundee, King's Cross Infectious Diseases Hospital.—Sen. R.M.O. £350.

East London Hospital for Children and Dispensary for Women, Shadwell, E.—H.S. £125.

Guildford, Royal Surrey County Hospital.—H.S. £150.

Hong-Kong Government.—Two M.O.'s. Also Asst. Port Health O. Each £600.

Leeds City.—Chief Clin. Tuberculosis O. £900.

Leeds University, Dept. of Pathology and Bacteriology.—Lecturer in Chemical Pathology. £600.

Liverpool, Royal Southern Hospital.—Hon. Asst. P. and Hon. Asst. S.

Liverpool, Samaritan Hospital for Women, Upper Parliament-street.—Hon. Asst. S.

Llanelly Borough Education Committee.—Dental S. £500.

London Hospital Medical College.—University Chair of Medicine. £2000.

Manchester, Hulme Dispensary, Dale-street.—Res. M.O.

Manchester Northern Hospital for Women and Children, Park-place, Cheetham Hill-road.—Sen. and Jun. H.S.'s. £130 and £100 respectively.

Manchester, St. Mary's Hospitals.—Three H.S.'s Each £50.

National Hospital for the Paralysed and Epileptic, Queen-square, W.C.—Asst. Path. £250. Also R.M.O. £200.

Paddington Board of Guardians.—Res. Asst. M.O. £327 12s.

Putney Hospital, Lower Common, Putney, S.W.—Res. M.O. £150.

Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Sen. Res. M.O., Two Asst. Res. M.O's. £100 and £80 respectively.

Queen Mary's Hospital for the East End, Stratford, E.—H.P., 2 H.S.'s, Obstet. H.S., also H P. and Cas. O.

Rochdale Infirmary.—M.O. in charge of X Ray, &c., Dept.

Royal Chest Hospital, City-road, E.C.—P. in charge of Out-patients.

Royal Ear Hospital, Dean-street, Soho.—Registrar. £50.

Royal London Ophthalmic Hospital, City-road, E.C.—H.S. £150. Also 2 Refraction Assts. Each £100.

Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Non-Res. Cas. O. £150. Also Hon. P. to Out-patients.

St. John's Hospital for Diseases of the Skin, Leicester-square, W.C.—Pathologist. £100.

St. Peter's Hospital for Stone, &c., Henrietta-street, Covent Garden, W.C.—Clin. Assts.

Sheffield Royal Infirmary.—Ophth. H.S., H.S., Asst. Cas. O., and H.S. to Ear, Nose, and Throat Dept. Each £60.

Stockport Infirmary.—Sen. and Jun. H.S.'s. £250 and £175 respectively.

University College Hospital, Gower-street, W.C.—Hon. Anæsth.

University of London.—External Examiners.

West Bromwich and District Hospital.—Res. H.S. £220.

West London Hospital, Hammersmith-road, W.—H.P., H.S., Aural H.S., Res. Cas. O. Each £100.

Births, Marriages, and Deaths.

BIRTHS.

ANDERSON.—On June 4th, at Albyn-terrace, Aberdeen, the wife of William Anderson, F.R.C.S., of a daughter.

BEADON.—To Richard à Court Beadon, and Dr. Mary O'Brien Beadon, M.B., B.S., W.M.S.I., Superintendent, Govt. Victoria Hospital for Women, Madras, on 28th April, 1924—a son.

HAMPTON.—On June 3rd, the wife of F. Anthony Hampton, M.B., of Blue Spur, Chesham Bois, of a daughter.

SHATTOCK.—On June 10th, at Mecklenburgh-square, to F. Mackenzie, M.B., B.S., wife of C. E. Shattock, M.S., F.R.C.S., of Harley-street, of a son.

MARRIAGES.

AYMER—FLOYD.—On June 5th, at St. Andrews, Boscombe, Charles Alastair Aymer, M.B., to Winifred Eileen Floyd, adopted daughter of W. Child Clark, Esq., of Michelgrove House, Boscombe.

DORGAN—STAPLETON-BRETHERTON.—On June 5th, at St. Mary's, Cadogan-street, Lieut.-Colonel James Dorgan, R.A.M.C., to Monica, daughter of the late Mr. and the late Hon. Mrs. Stapleton-Bretherton, of Rainhill, Lancashire.

HAYES—HERRON.—On June 4th, in London, Reginald Hewlett Hayes, M.R.C.S., to Alice, widow of Kenneth Chester Herron.

MORGAN—RELTON.—On June 5th, at St. Matthew's Church, West Kensington, Robert William Morgan, M.D., to Grace, daughter of the late F. H. Relton.

DEATHS.

ALLEN.—On June 4th, at "Marchings," Folkestone, very suddenly, Colonel Sydney Glenn Allen, A.M.S. (retired).

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

THE FRAMINGHAM HEALTH AND TUBERCULOSIS DEMONSTRATION.[1]

COMMUNITY PREVENTION, CONTROL, AND TREATMENT OF DISEASES, AS CARRIED OUT AT FRAMINGHAM, MASSACHUSETTS, U.S.A.

BY RALPH C. MATSON, M.D.,
DIRECTOR OF THE NATIONAL TUBERCULOSIS ASSOCIATION, U.S.A.

ONE of the first essentials of community prevention, control, and treatment of disease is that of education. The official health agency, receiving its money by budget, is usually restricted in its expenditure, and either unable or unwilling to expend money in experiments or demonstrations. It is therefore the duty of non-official or volunteer health organisations to demonstrate the value of our present knowledge regarding disease prevention, control, and treatment. Practically all units of community schemes for disease prevention, control, and treatment now utilised in America, such as sanatoria, open-air schools, preventoria, the public health nurse, &c., were shown to be of value by non-official organisations, before public officials were willing to accept them and expend funds for their maintenance.

The Community Health and Tuberculosis Demonstration at Framingham, Massachusetts, is an example of what can be accomplished by demonstration by a non-official organisation. It was established on Jan. 1st, 1917, by the National Tuberculosis Association with the financial assistance of the Metropolitan Life Insurance Company, to show that by the expenditure of a sufficient amount of funds it was possible to diminish both morbidity and mortality from tuberculosis in a community with an average equipment for health work.

The Metropolitan Life Insurance Company is interested in tuberculosis because 16 per cent. of the deaths in the industrial department are due to this disease. In 1915 the Company paid $4,000,000 on account of 14,325 policy-holders dying from tuberculosis. Tuberculosis is responsible for approximately one in every ten deaths in America, and one in every three industrial deaths is due to this disease. The National Tuberculosis Association alone, and through its associated State and local organisations, is expending upwards of $5,000,000 annually in its efforts to prevent, control, and eliminate tuberculosis, and it is quite natural to ask, "Of what value are present-day methods of disease prevention and control, and is this enormous expenditure of effort and money worth while?" The story of Framingham answers the question.

The Scope of the Work Attempted.

Framingham was selected for the demonstration because it represented a typical American community of about 17,000 people, with an average death-rate, average population, and average conditions, socially and industrially. Moreover, the local officials, voluntary health and civic organisations, expressed a desire for the demonstration, and assured coöperation. The object of the demonstration was essentially to discover all cases of tuberculosis in the community, to determine the economic and social factors in disease causation with special reference to tuberculosis, to apply the best-known methods of treatment, to develop a comprehensive programme of prevention, and organise the community for disease prevention and health creation.

One of the first things undertaken at Framingham was to secure the coöperation of local physicians and townspeople; the former was accomplished by organising a medical club, before which important lectures and clinics were given, concerning various phases of the tuberculosis problem and related medical problems. This also developed certain standards for tuberculosis diagnosis, and elevated the methods of diagnosis and treatment of this disease. Besides it secured the support and coöperation of local physicians almost to a man. The coöperation of the people of Framingham was secured by acquainting them with the motives, methods, and practical objects of the demonstration by means of special literature, daily press articles, numerous meetings, and the appointment of local representatives on the National Committee and the organisation of many local committees, representing various community interests, such as a local executive committee, a local advisory committee, an exclusion committee (whose duty it was to detect an invasion of the community by migratory consumptives), an industrial health committee, an infant welfare committee, neighbourhood committees, &c.

[1] A paper read at the First International Congress of the People's League of Health at Wembley on May 23rd, 1924.

The work began quite naturally with a series of investigations with reference to the incidence of tuberculosis infection and presence of the disease, the hygienic hazards, community resources, &c. Among the more important investigative activities may be mentioned:—

1. A general sanitary survey, including a survey of industrial hazards, school and factory conditions, including problems of general sanitation, cleanliness facilities, illumination, ventilation, heating, dust, fumes, safety devices, milk and food control, morbidity and mortality statistics.

2. Not only was the community's statistical background studied, but the people themselves were studied, by a sickness survey, designed to give a cross-section picture of the amount of disease of all kinds in the community and serve as a measure for comparing illness findings at the beginning, with similar findings at the end of the demonstration. This census was similar to the sickness canvasses and health censuses frequently conducted by life insurance companies, and was carried out by the trained agents of several large insurance companies, loaned for the purpose, assisted by trained nurses. This survey disclosed 1·8 per cent. incapacitating illnesses, 6·2 per cent. for all forms of illness, and only 0·24 per cent. tuberculosis (a point which shall be discussed later); 81·1 per cent. of the individuals recorded ill were receiving medical attention.

3. A number of medical examination campaigns were held. Not only industrial workers, but 14,000 of the 17,000 people living in Framingham, were given a thorough medical examination; this revealed an active tuberculosis present, in 1 per cent. of the population, with a prevalence of illness and disability of all kinds of 77 per cent.

4. A study of infant and child life in Framingham was made by visiting every home where a birth had taken place during the previous year, and recording certain essential prenatal, obstetric, and postnatal facts. A tuberculin survey was made by an expert on 460 children, ranging from 1 to 7 years of age. This was done to throw light, if possible, on the sources of childhood infection, and to select those most needing special care. It was also done to determine the reaction percentages of different nationalities, neighbourhoods, &c., as well as to determine the reliability of the tuberculin test in young age-groups as an index of tuberculous disease. This study revealed 33 per cent. positive reactions, which differed significantly in different race stocks. Of special interest are the findings in Irish and Italian race stocks. While the Italian stock gave the highest of positive reaction, very few cases of active tuberculosis were found among them either in adults or children. On the other hand, while the percentage of positive reactions among the Irish stock was low in Framingham, as elsewhere, the Irish stock contributes more than its share to the morbidity and mortality-rates. Re-examination of these children at subsequent dates disclosed no cases of demonstrable tuberculosis.

5. A careful investigation was made of the influenza sequelæ, which revealed many interesting things, among which was the relative degree of protection in the tuberculosis group, of which only 4 per cent. became afflicted with influenza, while 12 per cent. of the population at large was estimated to have had the disease. It is also interesting to note, in connexion with the incidence of influenza in race stocks, that while the tuberculosis incidence among the Irish was eight times that of the Italians, the Italians had an influenza incidence four times greater than the Irish.

6. A census was made of all individuals in Framingham, covering such environmental factors as hygiene, housing, economic status, &c.

7. A survey was made of tuberculosis infection among cattle supplying milk to Framingham.

"Community Diagnosis" and "Community Treatment."

As a result of the foregoing activities a "community diagnosis" was made. This was followed by a "community treatment," the basic principle of which was to continuously encourage the community to meet its own health requirements and place the non-experimental phases of the demonstration on a permanent basis. The "community treatment" comprised a number of activities, the most valuable of which was an expert consultation service, offering consultations to local physicians, factory medical and nursing staffs on cases of suspected tuberculosis or respiratory infections. This resulted in earlier diagnosis of tuberculosis, tripled reporting of tuberculosis, and tremendously increased the number of tuberculosis cases disclosed. It also encouraged the search for early tuberculosis and examination of contacts. This latter procedure resulted in the establishment of summer camps for pre-tuberculous children, as well as the establishment of domestic economy and good hygiene education for families having tuberculosis or under-par children.

The community was thoroughly organised, not only for the control of tuberculosis, but for general health and disease prevention. This included general community sanitation, the promotion of infant welfare work, school health work, industrial health work, tuberculosis nursing,

and a programme of education, which included lectures to mothers, and to industrial groups and health cinema programmes. These activities popularised health knowledge in the community and improved municipal methods of disease prevention, especially tuberculosis. The tuberculosis clinic was reorganised. Tuberculosis cases were placed under supervision as rapidly as they were discovered. Those requiring institutional care were sent to suitable sanatoria or hospitals, others were cared for in the dispensary or at home. The local board of health, the school committee, the Park Commission, the Framingham Hospital, the Civic League, and Red Cross were either developed or expanded, and aided directly or indirectly along financial and other lines.

The Changes which have Taken Place.

The foregoing is thus a brief sketch of the demonstration's purpose, its organisation, and activities. The changes which have taken place in Framingham may be summarised as follows. The demonstration is now in its last year, but has been so successful and convincing that the community has taken over all prenatal infant and pre-school work, all the school health work, and general health administration of the community, including tuberculosis nursing, tuberculosis and venereal disease clinic work, and to a large extent the health production and disease preventive activities in the industrial age-group; and, what is more significant, next year every activity undertaken in the demonstration and every suggestion made will be taken over as a community activity.

When the demonstration began, Framingham had only just appointed a full-time health officer, who had under his supervision the following activities: laboratory examinations, quarantine, care of tuberculosis cases, certain police duties, and a tuberculosis clinic. Within four years the board of health increased its budget 130 per cent. and established four infant clinics, one tuberculosis health station and clinic, with consultant on call at all times, one infantile paralysis clinic, one venereal clinic, a tuberculosis nurse visiting 100 patients, two infant and pre-school nurses visiting 450 babies, and three part-time infant welfare physicians.

Before the demonstration began there were 3039 children in Framingham schools with one part-time physician and one full-time nurse. Physical examinations were made only at request of the nurse. After five years of demonstration, at which time there was only a slight increase in the school population, the health organisation comprised one full-time physician, one nurse, one dental hygienist (who cleans mouths, holds tooth-brush drill, gives talks to classes, &c.), one dental clinic, and one director of physical education.

The Effect on Industrial Workers.

Naturally, the demonstration has evoked an intense interest in industry, as the highest death-rates are found in the industrial age-group. As a result of the demonstration, the devices for preventing accidents and procedures for improving the health of the workers have steadily increased. There are approximately 5000 industrial workers in Framingham, nearly half of whom are employed in one industry. When the health demonstration began the health work of this industry consisted of one nurse, one rest room, one-room clinic, a physician on call, and a sick benefit association. After five years of demonstration activity, the health equipment of this same industry consisted of one full-time physician, a three-room clinic, one full-time dentist, a dental clinic, two nurses, one rest room, complete surgical throat and ophthalmological outfits, and a sick benefit association assuring three weeks in the hospital in any one year if necessary. The plant was also organised on advanced democratic profit-sharing and management-sharing basis, with considerable participation in control by employees of different grades through industrial partnership, industrial associates, and shop committee devices. Compulsory examination of new employees is now carried out by the plant physician, this procedure being at the request of the works committee. It must be pointed out that medical and nursing facilities in industry can only functionate fully when developed and operated in very close coöperation with employer and employee, and should be used for the purpose of fitting the man to a job rather than as a means for rigidly weeding the unfit from industry. A Civic League was organised in 1917, and a year later opened its new building with a swimming pool and gymnasium open to the public. General health and educational work has been carried on regularly, and health clubs and community garden clubs are in operation. The two hospitals in Framingham have training schools and the student nurses assist in several important demonstration activities. One of these hospitals has a district nursing service.

The Park Commission has opened five playgrounds under the supervision of a physical director. General conditions in Framingham have undergone many constructive changes. The sewage system has been modernised, the milk-supply has been very much improved, the milk consumption has been doubled, and almost complete pasteurisation is in effect. Public spitting has been greatly reduced as a result of education and enforcement of city ordinances.

One of the most satisfying and significant results of the demonstration is the interest local physicians have taken in tuberculosis and their efforts to find new and early cases. This has been largely due to the highly efficient consultation service in charge of Dr. P. C. Bartlett, who with scientific skill and exceptional tact and judgment has made the service one of the most valuable features of the demonstration, and utilised by nearly all local physicians. The consultation service is not limited to tuberculosis work, but as far as possible it enters the field of general medicine. This service has attracted nation-wide attention, and is now in operation in Massachusetts, Illinois, New York, Oklahoma, Vermont, and Wisconsin.

The Results of the Investigations.

While the demonstration has been on a relatively small scale, it has revealed certain conditions, which one may say are representative of the average American community, and has brought out certain standards of community health work which can be advantageously applied to the country at large. Among the most important results of the investigative activities of the demonstration the following should be mentioned:—

1. In six years of demonstration the general death-rate has been reduced 16 per cent., the infant mortality-rate has been reduced 50 per cent., the tuberculosis death-rate 53·6 per cent. (the rates being corrected for non-residents and certification errors). While a reduction in these rates may have taken place anyway, or other factors were responsible, attention is invited to the fact that the death-rates in the towns about Framingham which were selected as control towns have experienced only slight reductions in the tuberculosis death-rate.

2. The examination of a representative population indicates that about 1 per cent. is suffering from active tuberculosis and an additional 1 per cent. from the disease in an inactive form. This corresponds to about ten active cases for every annual death in an average community. Therefore, in a city of 100,000 people there are probably 1000 cases of active tuberculosis. This is a percentage which has been substantiated by my own tuberculosis examinations of 174,000 American soldiers during the World War. Similar surveys in civil and military groups have given approximately the same percentage. (Of the first million American soldiers examined for military service in the World War 0·873 per cent. were rejected because of tuberculosis.)

3. These demonstration figures may well serve as a guide as to the percentage of tuberculosis which should be reported in a community. When the demonstration started at Framingham there were only 27 known cases of tuberculosis under care. The average ratio of reported cases to deaths was 3 to 1. After intensive search several hundred cases of tuberculosis were found and the ratio of reported cases to deaths was raised to approximately what it should be—namely, ten cases for every death. This means that a city with 100 deaths a year from tuberculosis should have reported approximately 1000 cases of active tuberculosis annually.

4. The number of cases requiring hospital or sanatorium care has been found to be one or two for every annual death in the community. Consequently a community should provide at least one, but preferably two beds for every annual death. One may estimate that about 42 per cent. of the total active cases under observation during the year will require institutional care. This will include, of course, many short stays in sanatoria or hospitals for educational and hygienic purposes.

5. In the beginning of the demonstration Framingham was equipped with a tuberculosis dispensary with a part-time nurse and medical attendant at the clinic. There was also an anti-tuberculosis society doing some educational work. This may be considered an average equipment for a city of 17,000 people. With this organisation as stated, the ratio of reported cases to annual deaths was 3 to 1. It is evident, therefore, that the average community reports little more than half the cases of tuberculosis and probably most communities report only about one-third. Consequently no effectual campaign can be waged against tuberculosis when only approximately one-third of the cases are under care, while two-thirds remain uncontrolled and potential sources of infection. This means that an efficient case-finding plan is necessary to bring the unknown half or two-thirds under supervision. In Framingham a sickness survey carried out by insurance agents and nurses disclosed some new cases after the health survey had been made. However, when practically the same area was canvassed and the residents given a thorough medical examination, nine times as much tuberculosis was found. Therefore, it is felt that routine medical examinations are necessary.

This can only be accomplished by means of an educational programme, which would have as its basis the evidence that in an average community about 90 per cent. of the population are infected with the tubercle bacillus, and of this 90 per cent. infected probably 2 per cent. have tuberculosis in an active or arrested state, but 10 per cent. will eventually die of the disease. Accordingly, the educational programme must teach how infection takes place, how children and others must be protected from massive infection by controlling open cases, improving general sanitation, and by the pasteurisation of milk-supplies. The educational programme must also teach that many cases can recover by proper institutional care, and there must be instilled into the community the idea of annual thorough medical examinations, which may be done at the clinic or by the family physician, with the help, if necessary, of the clinic, or consultation service, or by the factory or school physician, in the case of industrialists and children. It has been estimated that one factory or school physician is required for every 3000 individuals. An adequate nursing service must be provided also, of at least one nurse for every 2000 or 3000 people, to do infant welfare, school, factory, and home nursing, and follow up arrested cases of tuberculosis.

6. The consultation service is perhaps the most important single measure developed in Framingham for the discovery of tuberculosis. In addition to the foregoing, adequate institutional equipment, community organisation, and legislation are necessary.

It will thus be seen that tuberculosis in Framingham is being brought under control, and if these same methods could be applied to the entire United States it would mean a saving of 80,000 lives a year or more than were lost by the United States in the World War. It would prevent untold suffering and poverty, and when one considers the economic value of a human life, it is clear that, measured in the terms of money alone, the programme would mean a saving of millions of dollars annually.

Fundamental to the success of such a demonstration is the sympathetic coöperation and support of the local medical profession as well as the community in general. There must be created a strong sentiment for health work. The demonstration should be thoroughly grounded in the life, public affairs, and institutions of the community. It should show what scientific medicine is and what health movements are, and it should not permit itself to be regarded as a strange something, imported for the purpose of destructive criticisms and exposure of official and non-official agencies. Much of the credit for the success of the Framingham demonstration is due to the highly efficient service of its executive officer, Dr. D. B. Armstrong. The willingness and desire on the part of Framingham to develop and support an adequate health programme is reflected by the increased expenditure for health from 40 cents when the demonstration began to 2 dollars and 35 cents per capita last year.

Aside from local manifestations of benefit from the demonstration, its influence has been national in scope. It has stimulated scores of American communities to adopt new methods for discovering and caring for tuberculosis, as well as for infant welfare work. It has brought about the splendid big Millbank demonstration, which is applying the Framingham data to an entire county in New York State (Cataraugus), to a city of 175,000 (Syracuse), and to a district in New York City having a population of 216,000, and fairly typical of Greater New York City as to age-grouping, race stocks, birth- and death-rates, economic, social, and industrial conditions.

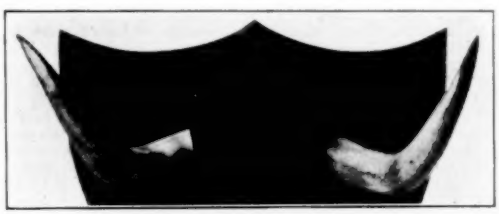
While the Framingham demonstration was primarily on tuberculosis, it has been very broad in its character. It has contributed to better health administration, better recreational facilities, better industrial relations and conditions. It has, in short, not been merely a medical demonstration; it has been a health and social demonstration to promote general healthfulness of the population at large, to prevent disease, reduce mortality, increase productiveness, and promote happiness.

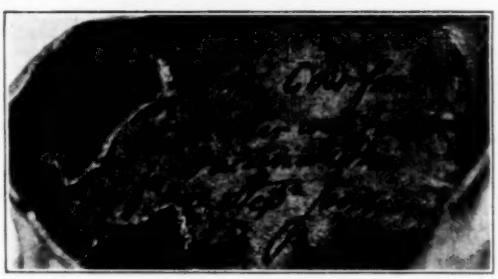
HOW CONSTANTINOPLE WAS CLEANED UP IN 1922.

IN the *Journal* of the R.A.M.C. for May Captain R. McKinlay tells the story of the sanitary difficulties which faced the Allies at Constantinople in 1922, when he was the executive officer of the Inter-Allied Urban Sanitary Commission, of which the British D.M.S. was president. Of the Inter-Allied Maritime Sanitary Commission the president was a French medical officer. The health of the city was a joint responsibility of the municipality and the Government, both near bankruptcy, unable to pay their staff, and so getting inferior service. The Turkish doctors, whose month's salary, long in arrear, was less than a skilled artisan in England gets every week, gave at first an impression of lethargy, but when they found themselves employed by people who took a real interest in their work and their welfare they worked well. The actual sanitary conditions were deplorable; water was insufficient in summer and bad (*B. coli* in 0·5 c.cm.), and people made it worse by dipping it out of main conduits in buckets. There was no conservancy; refuse was just cast out into the street. It took the Allies a year to get the city cleaned up, but by that time the inhabitants had found it cheaper to use sanitary dustbins than to pay fines. There were almost no drains, and those there were were badly built of brick, leaking and untrapped, and to these conditions the residents had learned to accommodate themselves, for "even in some of the best houses one is met by an intolerable odour, apparently not noticeable to the inhabitants." The scourges of Turkey are supposed to be three: tubercle, malaria, and venereal disease; how these were dealt with may be read in the paper. The overwhelming problem of Constantinople has been the refugees; groups amounting to over half a million are enumerated. They swelled the myriads of the prostitutes; "semi-starved and filthy, this vagrant population scattered vermin, often infected." This paper should be read in full for the graphic picture which it gives of sanitary problems in the Near East.

JENNER RELICS: THE HORNS OF THE FIRST COW TO SUPPLY VACCINE VIRUS.

AN interesting relic—namely, the horns of the cow from which the lymph was first taken for vaccination—is described in *Berrow's Worcester Journal* of May 24th, and by the courtesy of Mr. G. A. Turner, of Anderson and Virgo's Dispensing Establishment, Worcester, we are able to give illustrations of the horns. These were purchased from a furniture dealer of Barbourne, whose father has stated that the horns had been in the family for upwards of 80 years, and that they were bought from the grand-nephew of Edward Jenner, Mr. Stephen Jenner, in whose handwriting is





the label on one of the horns. Mr. Turner has made exhaustive inquiries as to the history of the horns and has collected much evidence which, incidentally, includes a photograph of the son of Mr. Henry Phipps, of Berkeley, the first man who was ever vaccinated, and a photograph of the house where Jenner lived. He has verified the handwriting of Stephen Jenner, who was one of the attesting witnesses to the will of the discoverer of vaccination, and the signature is also confirmed by Mr. Scott, solicitor, of Gloucester, whose firm have acted for the Jenner family for a century. It may be noted that among other things which Mr. Stephen Jenner sold to the furniture dealer were some sketches in water colour of fresh-water fish said to have been drawn by Edward Jenner. There does not seem to have been any reference to these in the collection of Jenner relics sold at Messrs. Sotheby, Wilkinson, and Hodge's some 18 months ago (THE LANCET, July 29th, 1922, p. 260). It may be added that in the pathological department of St. George's Hospital there is a cow-hide which bears the inscription: "The skin of the cow from which the first vaccine matter was taken by Dr. Jenner. Presented by his son, October, 1857," and it is suggested that presumably the horns shown in the photograph belong to that hide. There is also in the Royal College of Physicians of London a horn which is stated to have belonged to a Jenner cow, the inscription being: "The horn of a cow given by the benefactor of man, Dr. Jenner, to his friend Sir John Fisher, and presented to this institution in 1813."

PUBLIC HEALTH IN NEW ZEALAND.*

THE report on Public Health in New Zealand during the 12 months ending March 31st, 1923, states that the census population in April, 1921, was found to be 1,218,913 (not including 52,751 Maoris); and that the mean population for 1922 (also exclusive of Maoris) was estimated to be 1,251,895, showing a percentage increase on the previous year of 2·29. The birth-rate (23·17 per 1000) was lower than in any year previously recorded except 1919, when it was 21·54 per 1000; though the *number* of births (29,006) was greater than in any year except 1920 (29,921). It may be presumed that these numbers and ratios refer to the calendar years mentioned. The infant mortality (under 12 months of age) shows a most marked and progressive improvement; in the decennium 1901–10, the ratio varied from 61·6 in 1909 to 88·8 in 1907; for 1911–20, from 45·3 in 1919 to 59·2 in 1913; in 1921 it was 47·8; and in 1922 41·9, the lowest on record.

An Epidemic of Enteric Fever.

There was no special incidence of infectious disease during the 12 months except an outbreak of enteric fever at Mount Albert, a suburban borough adjoining Auckland city, with a population of 12,500. The borough has its own water-supply from "a spring tapped at the bottom of a well which passes through volcanic scoria rock. . . . The catchment area . . . covers the slopes of an extinct volcano about 400 feet high . . . . A few lava streams come from the hill, and the spring is probably an old water-course, flowing from the hill, but covered with lava and scoria ash. These scoria beds vary in depth, being several hundred feet at the actual cone, but thinning off to nothing at the edges of the volcanic area. The stream forming the water-supply at Mount Albert is deeply covered throughout the catchment area. The lava beds are much broken and fissured . . . . It is difficult in such country to know what the actual catchment area is, as springs flow out from the cone in various directions; but on the possible catchment area there are now about 1000 houses, most of which have been built in the last five or six years." When the spring was first used about 12 years ago there were few houses on the catchment area and the water was very pure, both chemically and bacteriologically. The houses have increased in number; there are no sewers, drainage soaks into the very porous scoria soil, dumps being dug for the purpose. "As might be expected, this increase of population on the catchment area has been a source of anxiety to the Health Department, and a watch has been kept on the purity of the water for some years. Warning of diminished purity was sent to the Borough Council in 1913, but the water was not in such a condition as to cause serious alarm till November, 1921." The chemical and bacteriological analyses were, shortly, in January, 1921, albuminoid ammonia, 0·0023; chlorides, 3·1; nitrites, nil; nitrates, 0·43 per 100,000; oxygen absorbed in four hours at 80° F., nil; colonies on gelatine at 22° C., 49; on agar at 37° C., 24; *B. coli* not present in less than 5 c.cm. In November, 1921, *B. coli* was found in 0·1 c.cm.; colonies on gelatine, 127 per c.cm. (agar colonies not stated). The council were warned that the water was no longer safe, and chlorination was carried out; the smallest quantity containing *B. coli* was then (December) found to be 50 c.cm. The council reduced the amount of chloride added on account of complaints as to taste, and in March the medical officer recommended that it should be increased. Up to April 7th seven cases of typhoid had been notified in the whole metropolitan area, and there was nothing suggestive of an epidemic in any part of the Auckland district. On the 8th the first case of the epidemic in Mount Albert Borough was notified; on the 10th *B. coli* was found in 0·01 c.cm. water from the pump well (apparently at the Avondale Asylum); a number of cases of "gastric influenza" were reported in Mount Albert district. On the 13th the reservoirs were chlorinated and the mains flushed, and the city water then turned on throughout the area. On the 17th the inhabitants supplied from Mount Albert Borough station were warned to boil the water, and the public schools closed, as it was not possible to prevent the children from drinking unboiled water from the school taps. The progress of the epidemic was as follows: from April 3rd to 10th, one case; from April 10th to May 22nd the cases week by week numbered 23, 59, 35, 17, 11, and 5 respectively; there were four cases in the week ending June 5th, and one case near the end of the month. The cases numbered 156 from April 3rd to June 30th; and in addition to these there were 60 cases at the Avondale Asylum, commencing in the first two weeks of April. The total cases during the epidemic therefore numbered 216. The deaths appear to have been 14 in Mount Albert District and 17 in the asylum. The "spot map" referred to on p. 21 as showing "very conclusively how markedly the area supplied from the Mount Albert pumping well has been picked out by the incidence of the typhoid cases" is unfortunately omitted from the report. Otherwise this account of the typhoid outbreak and its causation, by Dr. R. H. Makgill, acting medical officer of health, Auckland, is most complete and convincing. "It is interesting to learn from the Government bacteriologist that infection was not confined to one organism of the enteric group, but that typhoid and both types of paratyphoid infection were detected. This is suggestive of a fairly widespread state of pollution on the catchment area."

Child Welfare and School Inspection.

Considerable progress has been made in regard to the important subject of child welfare; public lectures and demonstrations, addresses to teachers and midwives, mothers and young women, have been well attended. The average infantile death-rate for the whole Dominion has been reduced from 47 per 1000 births in 1921 to 42 in 1922, the lowest on record. "The Plunket Society has become practically part of the work of our hospitals." The Plunket nurses subsidised by Government have been increased from 60 to 71. Infantile diarrhœa and enteritis, that formerly killed from 10 to 20 babies per 1000 births, have fallen to three deaths per 1000; at Dunedin the mortality from this cause, which was 25 per 1000 in 1907, has been under one per 1000 for the quinquennium; at Christchurch the ratio has fallen from 45 to 3. Dr. Truby King, director of child welfare, remarks very forcibly that "it is much cheaper and easier to rear babies and calves rightly than wrongly," and quotes the aphorism of Socrates: "The beginning is the most important part, especially when we have to deal with anything young and tender." School medical inspection has been carried out under Dr. E. H. Wilkins as director, and Mr. T. A. Hunter as director of dental hygiene. Among 34,382 children examined 88·34 per cent. were found to have defects; defects other than dental were found in 60·40 per cent., dental decay was present in 67·16 per cent. Postural and structural deformity of the trunk and chest (26·03), enlarged cervical glands (11·25), enlarged tonsils (11·23), subnormal nutrition (7·41), and goitre (6·20) were the chief abnormalities detected. Vision was defective in 3·18, and hearing in 0·79 per cent. of the children. In the treatment of goitre with salts of iodine the results have been encouraging, about half the cases having derived considerable benefit. The school nurse is warmly welcomed by the majority of parents, but a much larger number of nurses is required.

Hospitals.—Native Population.

At the five hospitals and sanatoriums scattered over New Zealand a total of 1495 patients were admitted during the 12 months, April, 1922, to March, 1923; these, added to the 451 present at the beginning of the period, make a total of 1946 treated, the daily average present being 132; 1007 were cured or relieved, and 59 died. The Maori population (52,751) shows an increase of 2975 over the previous census of 1916. The proportion of females to males has risen from 832 per 1000 in 1891 to 890 in 1921; there are now 23·6 Europeans to one Maori. All the Maori health councils are in working order except those in South Island. The health of the native population shows an improvement over that of the previous year, "due in no small measure to the activities of the Maori health councils, under guidance of the native nurses and inspectors."

* Wellington: Government Press. 1923.

HEALTHY SOUTH AFRICA.

Mr. R. Gwelo Goodman is showing at the Royal Institute Galleries a record of ten years' painting in South Africa. It is a very interesting and varied show, and may be commended to medical men with an interest in a country which has so much to offer to health-seekers. The purity and clearness of the air and the generous sunshine are evident from the presentation of local detail in the distances of these fascinating pictures.

IS A "DENTAL WHO'S WHO" WANTED?

A SUGGESTION having been made that a "Dental Who's Who" on similar lines to "The Medical Who's Who," confined to licentiates and graduates in dental surgery, would be welcomed, the Grafton Publishing Company is inquiring to what extent the dental profession would be willing to coöperate before committing themselves to the heavy expenses involved in bringing out the first edition which probably could not be issued under 15*s.* 6*d.* It would be revised and published annually. Should the replies received by the Company at Chichester House, Chancery-lane, London, warrant the undertaking, a "particulars form" will be forwarded in due course.

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